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Beltsville, Maryland

July 1984

# National Potato Germplasm Evaluation and Enhancement Report, 1983

Fifty-fourth Annual Report  
by Cooperators

U.S. NA

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POTATO  
Germplasm  
Evaluation  
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Report  
1983

ALL





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UNITED STATES DEPARTMENT OF AGRICULTURE  
BELTSVILLE AGRICULTURAL RESEARCH CENTER (BARC), BELTSVILLE,  
MARYLAND, AND CHAPMAN AND AROOSTOOK FARMS, PRESQUE ISLE,  
MAINE

Raymon E. Webb, Philip Baum, George W. L. Walter, and  
Robert W. Goth, BARC, and David R. Wilson, Presque Isle,  
Maine

BARC

Breeding and Evaluation: One hundred thirty-seven parental clones selected for a diversity of stress resistance/tolerances and quality characteristics were included in the hybridization planting. Three hundred fifty-seven parental combinations were effected, resulting in approximately 220,000 true seed. Progenies of 98 parental combinations were grown during the fall in the greenhouse. About 31,000 seedlings developed tubers. The A-size tubers will be planted in Maine in 1984, and the B- and C-size tubers have been distributed to Minnesota, Nebraska, Colorado, and North Carolina. Two hundred sixty-eight selections were rechecked for viruses X and Y, and flowering clones are scheduled to be included in the 1984 hybridization planting. Two hundred fourteen selections from a 2,200 seedling population surviving a field-induced epidemic of late blight were inoculated with Race 1, 2, 3, 4, in the greenhouse. Fifty of the most resistant selections were repotted to be included in the 1984 mass pollination crossing block. One hundred eighty-one advanced selections were evaluated for resistance to viruses A, X, and Y. Seventy-two percent were resistant to virus A, 34 percent resistant to virus X, and 8 percent resistant to virus Y. Eight clones, included in the leaf roll resistance field test and ELISA-tested free of the virus in their tubers, were subsequently field grown, and plants were healthy.

Promising clones were furnished to Florida, South Carolina, Georgia, Alabama, Mississippi, North Carolina, Virginia, New Jersey, New York, and Michigan for trial. Clones for observational trials were made available to Florida, Virginia, New Jersey, New York, and Michigan. Advanced clones were sent to several foreign countries.

Presque Isle

Planting began on May 12 and was completed on June 8. In general, the growing season was warm and dry (Table 1). High winds in early August did considerable vine damage. Yields were again about 30 percent below those of years with normal, well-distributed rainfall.

Chapman Farm: Approximately 24,000 first-year seedling tubers were grown, and about 1,800 selections were made. One hundred twenty-six 12-hill selections were retained for further tests. Two hundred six entries were selected from the 60-hill clonal planting for winter processing and viral

resistance trials. Selected clones from the 80- and 100-hill lots were retained for further evaluations and seed increases. Foundation seed increases were done on white flowered mutants WF31-4, WF46-3, and WF46-4 from Atlantic. A preliminary yield trial of clones processing directly from 40° F storage was done on Chapman.

Aroostook Farm: Seed increases were done on popular varieties. Seed maintenance plantings were done on about 115 older varieties and breeding lines. Late blight resistance evaluations were done on about 2,200 seedling transplants and about 220 clonal selections. Some 214 seedling selections were made for greenhouse trials at BARC. Approximately 1,400 clones resistant to virus Y in greenhouse trials at BARC were grown for horticultural evaluations. Two hundred sixty-eight selections were retained for breeding and further evaluation. Only about 8 percent of the entries in the Verticillium wilt trials had significant levels of tolerance under the inoculum load and prevailing warm, dry weather conditions. A yield trial of 10 white flowered mutants from Atlantic was conducted on Aroostook Farm.

Echo Lake: Major seed increases were done on 12 promising russet and 8 round white clones. Seed of 10 russet and 6 round white clones were distributed to one or more foundation seed growers, and most were placed in interregional yield trials. Four round white and three russet yield trials were conducted on Echo Lake. These were harvested after an 84-day growing period because of late season excessive wind damage to vines.

## General

Yield and disease-resistance trials were done on Aroostook Farm. Experimental design for all yield trials was a randomized block with four replications of 25 seed pieces each. White tuber trials received 150 pounds of NPK per acre, and russet types received 180 pounds NPK per acre banded with a two-row planter. Seed spacing for white tuber trials was 9 inches and for russet trials 12 inches. All plantings were done by hand.

Cultural methods and materials for weed, insect, and disease control were according to local recommendations. Rainfall and temperature during the season are given in Table 1. At harvest, all entries were graded and samples hand selected for specific gravity and quality evaluations. Specific gravity was determined by the air-water method. Following specific gravity determinations, selected samples were divided and placed at 50° F, 45° F, and 40° F storage at 90 percent relative humidity.

Samples stored at 50° F were processed after 2 months, and those at 45° F were processed into chips after 4 months in storage. Round white tuber amples stored at 40° F were



divided into two groups: one group to be reconditioned at 70° F for 3 weeks prior to frying; and one group to be fried directly from 40° F after 5 months' storage if processing data from the 45° F and 50° F stored group indicated potential low reducing sugar content buildup at that temperature. Russet samples were also processed into french fries.

Potato chips were made from each sample by cutting the russet tubers in half and taking a 1/16-inch-thick slice from each tuber with a rotary food slicer. Slices were rinsed in water and placed on paper towels to remove excess water. Chips were then fried at 340° F in Primex vegetable shortening until bubbling ceased.

A french fry plug, 3/8 inch in diameter, was cut from each half of the tubers in the sample. After plugs were trimmed, rinsed, and excess water removed, they were fried at 365° F in Primex shortening for 5 minutes.

Each potato chip and french fry was classified after frying into color classes. Chip classes ranged from 1 = very light to 10 = very dark. French classes ranged from 1 = very light to 5 = very dark. Weighted averages were calculated by multiplying the number of chips or fries in each color class by the color class, totaled, and divided by the number of chips or french fries in each sample. Color ratings were made by using the PCII reference color chart 1206-U.

After color classification, each french fry plug was broken open and internal texture classification as 1 = mealy, 2 = intermediate, or 3 = soggy, and a weighted texture index calculated.

#### Summary

Russet clones B9398-2, B9540-55, B9540-62, B9553-6, B9569-2, B9596-2, B9720-3, B9740-4, and B9752-7 are in the grower seed increase phase. Round white clones B9140-32, B9340-13, WF31-4, WF46-3, and WF46-4 are on seed increase also. Clones B8687-13 and B9192-1 showed some growth cracks in 1983 and will be studied further on a smaller scale. Clones from Solanum phureja and S. chacoense backgrounds, which process directly from extended storage at 40° F, are also on seed increase for wider adaptability trials and potential release to the seed production community.

BARC Table 1. Weekly average maximum and minimum temperature and weekly rainfall, Aroostook Farm, Presque Isle, Maine, 1983.

Week Ending	Avg. Temperature F		Rainfall Inches
	Min.	Max.	
May 7	39.9	63.1	1.06
14	41.6	59.4	.78
21	38.1	62.2	.15
28	42.7	57.9	1.21
June 4	42.7	61.6	2.08
11	44.1	70.1	.08
18	57.1	80.9	.06
25	58.1	86.1	T
July 2	49.3	78.7	.24
9	55.9	80.0	1.31
16	51.1	75.7	2.20
23	49.9	75.6	1.04
30	57.0	79.9	.46
Aug. 6	57.6	80.6	.86
13	51.3	74.3	.64
20	57.6	82.4	T
27	51.3	75.1	.65
Sep. 3	54.0	72.4	1.61
10	57.0	80.1	.56
17	38.9	67.6	.40
24	45.4	70.9	1.41
Oct. 1	41.3	67.3	.10
Total			16.90



BARC Table 2. Yield, tuber size, distribution, and quality characteristics of clones harvested 84 days after planting on Echo Lake, 1983.

Pedigree	Mkt Cwt	%	% Tuber Size Distribution						Tuber Rating <sup>1</sup>	Sp. Gv. <sup>2</sup>	Chip Color <sup>3</sup>		
			1-7/8"- 2-1/4"- 3-1/4"-								50°F 2 mos.	45°F 5 mos.	40°F-70°F 3 weeks
			<1-7/8"	2-1/4"	3-1/4"	4"	>4"						
B7805-1	299	90	4	13	71	16	6	7	70	8.6	9.8	9.9	
B8091-8	296	86	13	37	54	9	1	6	77	6.2	8.4	10.0	
B8701-10	333	91	6	27	65	7	4	6	82	5.5	6.4	7.1	
B8706-7	293	92	6	22	68	11	2	7	72	6.6	8.4	9.7	
B8710-1	316	85	7	27	61	12	9	6	66	6.2	8.7	9.9	
B8710-16	313	83	5	13	60	27	12	7	71	7.4	9.3	9.8	
B8798-20	253	92	9	27	64	9	-	6	74	6.4	8.2	8.9	
B9140-32	247	89	11	46	50	5	-	6	79	5.3	6.9	8.5	
B9192-1	293	93	5	16	70	14	2	5	76	5.2	6.6	8.7	
B9224-6	264	83	12	33	57	10	4	5	68	7.1	8.4	9.3	
B9335-3	287	85	7	24	63	13	8	5	71	7.6	8.3	9.4	
B9336-27	259	79	12	31	54	15	9	5	75	5.2	7.8	8.8	
B9340-13	307	89	11	40	56	4	-	6	74	5.5	6.8	9.0	
B9387-4	300	88	9	29	61	10	3	6	67	5.0	7.4	8.7	
B9507-14	331	92	8	39	58	4	11	6	75	5.2	6.2	6.7	
Atlantic	247	84	11	33	52	15	5	5	78	6.4	7.5	9.0	
LSD .05	38								3.7				

<sup>1</sup>1 = poor; 9 = outstanding.

<sup>2</sup>1.0 omitted.

<sup>3</sup>Chips: 1-7 satisfactory

BARC Table 3. Yield, tuber size, distribution, and quality characteristics of clones harvested 84 days after planting on Echo Lake, 1983.

Pedigree	Mkt Cwt	%	% Tuber Size Distribution							Tuber Rating <sup>1</sup>	Sp. Gv. <sup>2</sup>	Chip Color <sup>3</sup>		
			1-7/8"- 2-1/4"- 3-1/4"-				>4"	50°F 2 mos.	45°F direct 5 mos.			40°F-70°F 3 weeks		
			<1-7/8"	2-1/4"	3-1/4"	4"								
B9515-2	242	89	11	50	48	2	-	5	69	5.1	6.0	6.5		
B9516-8	259	93	6	23	62	14	1	4	79	5.1	6.0	6.7		
B9518-1	229	91	10	41	54	5	-	5	82	5.3	7.2	7.6		
B9518-3	187	83	17	55	45	-	-	6	82	5.1	5.8	6.2		
B9530-13	236	88	6	26	61	13	6	5	83	5.3	6.2	7.8		
B9536-3	232	85	11	44	51	5	3	4	85	5.4	6.8	7.5		
B9542-7	326	93	7	36	56	8	-	5	64	6.1	6.8	8.4		
B8701-12	355	94	6	29	57	14	-	5	70	5.0	6.4	9.0		
B8702-14	230	84	16	50	50	-	-	5	63	5.9	7.2	8.9		
B8702-15	286	90	10	39	54	7	-	5	67	5.5	6.9	8.0		
B8702-18	296	84	10	39	58	3	6	5	67	5.6	8.0	9.1		
B8706-8	283	86	6	19	61	20	8	5	63	5.7	7.2	9.6		
B8706-14	290	91	7	27	55	18	2	5	73	6.2	8.4	9.7		
B8706-15	225	90	10	33	59	8	-	5	83	6.0	7.4	9.0		
B8724-2	295	87	12	47	49	4	1	4	67	6.3	7.2	8.5		
Wauseon	291	85	6	27	59	14	9	6	61	5.5	9.5	10.0		
LSD .05	42											3.6		

<sup>1</sup> <sup>2</sup> <sup>3</sup> - See footnotes Table 2

BARC Table 4. Yield, tuber size, distribution, and quality characteristics of clones harvested 84 days after planting on Echo Lake, 1983.

Pedigree	Mkt		%	% Tuber Size Distribution						Tuber Rating <sup>1</sup>	Sp. Gv. <sup>2</sup>	Chip Color <sup>3</sup>			
	Cwt	Mkt		<1-7/8"		1-7/8"-2-1/4"		2-1/4"-3-1/4"				>4"	50°F	45°F	40°F
													2 mos.	5 mos.	3 weeks
B8799-13	243	87		9	48	49	3	4	6	77	5.8	7.1	9.0		
B9164-1	270	92		8	36	48	16	-	6	72	6.2	8.0	9.8		
B9311-7	279	86		8	30	64	6	6	4	74	6.6	7.1	9.1		
B9335-7	288	93		5	23	62	15	2	6	65	5.4	9.3	10.0		
B9335-35	285	90		10	39	57	4	-	6	74	5.3	7.5	8.9		
B9336-24	259	87		11	31	55	14	2	5	73	5.6	7.2	9.4		
B9423-4	392	89		10	37	51	12	1	7	65	6.5	9.2	10.0		
B9510-5	255	84		16	43	53	4	-	5	69	5.4	6.7	8.0		
B9514-17	317	91		8	33	63	4	1	6	69	5.6	6.6	8.1		
B9514-38	324	93		7	33	61	6	-	7	66	5.5	6.8	8.9		
B9525-14	279	90		10	43	53	4	-	6	77	5.9	8.1	10.0		
B9527-1	241	89		11	53	40	6	-	4	70	5.4	7.8	8.8		
B9528-10	327	93		4	20	67	13	3	6	72	5.2	6.7	8.6		
B9531-8	258	87		12	42	52	6	1	5	76	5.3	6.7	7.9		
B9531-12	268	87		9	31	55	14	4	6	75	5.7	7.5	8.5		
Belchip	299	80		5	20	45	35	15	6	71	5.3	6.5	8.5		
LDS .05	47														
										5.4					

1 2 3 - See footnotes Table 2

BARC Table 5. Yield, tuber size, distribution, and quality characteristics of clones harvested 84 days after planting on Echo Lake, 1983.

Pedigree	Mkt Cwt	%	% Tuber Size Distribution							Tuber Rating <sup>1</sup>	Sp. Gv. <sup>2</sup>	Chip Color <sup>3</sup>		
			1-7/8"- 2-1/4"- 3-1/4"- 4"- >4"									50°F	45°F direct	40°F-70°F
			<1-7/8"	1-7/8"	2-1/4"	3-1/4"	4"	>4"	2 mos.			5 mos.	3 weeks	
B9532-3	269	84	7	32	64	5	9	5	72	5.2	6.3	8.3		
B9536-8	327	89	5	21	69	10	6	5	71	5.6	6.5	8.2		
B9536-11	288	91	9	37	60	3	-	5	71	5.8	6.9	9.7		
B9536-20	266	87	5	16	63	21	8	5	71	5.9	6.8	9.1		
B9536-23	249	90	7	25	62	12	3	5	76	5.8	6.4	8.8		
B9536-33	296	90	6	28	62	11	4	5	75	5.2	6.1	8.4		
B9541-20	209	92	6	24	66	11	2	5	72	5.7	7.2	8.8		
B9541-44	243	92	8	28	61	12	-	5	70	5.4	7.4	8.7		
B9581-10	342	85	4	19	54	27	11	5	72	6.7	7.3	8.1		
B9602-12	296	88	6	21	55	25	6	6	63	5.8	7.2	9.6		
B9607-3	307	91	5	23	58	19	4	6	73	5.6	6.9	8.2		
B9628-17	174	73	19	61	36	3	8	4	72	5.6	7.6	9.1		
B9638-11	273	91	7	23	60	18	2	4	72	6.4	7.2	9.4		
B9642-5	246	80	5	21	65	14	15	4	74	6.7	6.9	9.5		
Belchip	277	85	2	14	56	30	13	5	79	5.5	6.8	8.4		
Chipbelle	277	84	6	33	59	9	10	5	84	5.8	6.3	8.6		
LSD .05	42											5.6		

1 2 3 - See footnotes Table 2

BARC Table 6. Yield, tuber size, distribution, and quality characteristics of clones harvested 84 days after planting on Aroostook Farm, 1983.

Pedigree	Mkt Cwt	% Mkt	% Tuber Size Distribution						Tuber Rating <sup>1</sup>	Sp. Gv. <sup>2</sup>	Chip Color <sup>3</sup>				
			1-7/8"- 2-1/4"- 3-1/4"-								4"	>4"	50°F	45°F direct	40°F-70°F
			<1-7/8"	2-1/4"	3-1/4"	4"	4"	2 mos.					5 mos.	3 weeks	
WF4-4	360	91	7	33	60	7	2	5	85	5.4	7.6	8.5			
WF7-2	352	93	7	35	56	9	-	5	81	5.6	6.7	8.6			
WF7-4	360	92	7	33	62	5	1	5	79	5.8	7.2	8.6			
WF13-3	337	92	7	39	51	10	1	5	81	5.5	7.4	8.6			
WF13-4	331	90	8	39	58	3	2	5	82	5.4	7.0	8.2			
WF27-2	335	93	6	32	61	8	1	5	82	5.6	7.4	8.1			
WF30-2	351	92	6	34	59	7	2	5	80	5.4	7.2	8.6			
WF31-4	326	93	7	35	57	9	-	5	83	5.6	7.3	8.3			
WF46-3	317	92	7	33	60	6	1	7	83	5.9	7.2	8.3			
WF46-4	328	91	9	49	48	3	-	7	81	5.6	7.2	8.2			
Atlantic	321	91	9	41	52	7	-	6	82	5.4	7.0	8.8			
LSD .05	51								4.6						

<sup>1</sup> <sup>2</sup> <sup>3</sup> - See footnotes Table 2

BARC Table 7. Preliminary yield of clones with potential of chipping directly from low-temperature storage, Chapman Farm.

Pedigree	CWT/Acre Marketable Yield	Specific 1.0- Gravity <sup>2</sup>	Chip Color <sup>3</sup>			
			50°F 2 mos.	45°F 5 mos.	40°F 5 mos.	40°F-70°F 14 days
B9792-1B	145	84	5.0	6.2	6.7	6.3
" -2B	184	91	5.0	5.8	6.3	5.5
" -8B	220	82	6.1	6.3	7.3	6.9
" -13B	181	81	5.0	5.4	6.0	6.1
" -16B	173	84	5.2	7.0	7.0	6.4
" -17B	162	84	5.0	5.9	7.0	5.4
" -19B	207	80	5.2	5.9	7.9	6.5
" -27B	144	81	5.0	5.5	7.2	5.8
" -38B	IC	90	5.0	6.7	7.5	6.3
" -53	IC	89	5.0	6.0	6.4	6.7
" -56	173	84	5.3	6.3	7.7	6.8
" -61	164	82	5.0	5.6	6.6	6.2
" -69	225	82	5.0	6.4	8.1	6.8
" -79	202	87	5.0	6.2	7.4	6.3
" -84	240	83	5.0	5.7	7.7	6.8
" -95	155	89	5.1	5.6	7.2	6.1
" -97	165	88	5.1	5.4	7.1	4.5
" -109	107	80	5.1	5.7	7.6	6.7
" -119	205	85	5.9	6.6	8.3	6.4
" -132	208	84	5.0	6.0	7.2	6.3
" -136	257	82	5.3	7.0	8.3	7.2
" -137	211	85	5.2	6.5	8.0	6.6
" -144	233	72	5.1	6.7	8.3	7.2
" -147	217	88	5.1	5.5	7.3	6.4
" -157	247	80	5.0	6.0	6.7	6.1
" -184	188	87	5.2	6.4	6.8	5.8
" -186	197	78	5.0	6.1	8.3	6.7
" -190	222	79	5.5	6.8	8.6	7.4
" -193	177	87	5.0	6.3	7.4	6.4
" -194	241	78	5.9	7.2	8.9	7.9
" -196	237	86	5.1	5.2	7.3	5.8
" -197	240	86	5.1	6.3	7.7	7.6
Atlantic	191	83	5.8	7.2	8.1	6.8
Belchip	245	75	5.2	6.4	7.8	7.4
Chipbelle	194	86	6.4	6.7	8.6	6.4
LSD 5%	46	4.3				

<sup>2</sup> <sup>3</sup> - See footnotes Table 2

BARC Table 8. Yield, tuber size, distribution, and quality characteristics of clones harvested 84 days after planting on Echo Lake, 1983.

Pedigree	Mkt Cwt	%	% Tuber Size Distribution					Tuber Rating <sup>1</sup>	Sp. Gv. <sup>2</sup>	50°F		French Fry			
			<1-7/8"	1-7/8"- 2-1/4"- 3-1/4"-			>4"			2 mos. Col <sup>3</sup> Tex <sup>4</sup>	45°F direct 5 mos. Col <sup>3</sup> Tex <sup>4</sup>	40°- 70°F 3 weeks Col <sup>3</sup> Tex <sup>4</sup>			
				2-1/4"	3-1/4"	4"									
B8972-1	236	86	14	35	55	10	-	5	70	2.0	1.9	2.7	2.0	3.9	1.9
B9391-2	250	88	9	27	59	14	3	6	72	2.8	2.1	3.9	2.1	4.3	2.0
B9395-25	277	87	8	19	63	18	5	5	70	2.6	2.0	3.5	2.3	4.5	2.2
B9398-2	247	89	8	22	55	23	3	5	71	2.5	2.0	2.0	2.0	3.2	2.0
B9399-1	238	83	14	27	61	10	3	5	68	2.5	2.0	3.5	2.0	4.6	2.0
B9400-5	285	89	6	20	56	23	5	6	65	3.4	2.0	4.3	2.5	4.8	2.5
B9419-6	276	87	13	45	50	5	-	5	62	2.4	2.0	3.2	2.3	4.1	2.0
B9523-10	238	85	5	21	61	19	10	5	61	2.6	2.0	4.0	2.0	4.2	2.0
B9523-15	258	86	14	36	57	8	-	5	63	2.5	2.0	3.8	2.0	4.6	2.0
B9703-4	225	88	12	31	59	10	-	4	67	2.5	1.9	3.3	2.1	4.1	2.1
B9539-4	312	91	8	28	54	11	1	5	71	2.8	2.0	3.5	2.0	4.1	2.0
B9539-9	316	93	6	30	62	9	1	5	76	2.4	2.0	3.0	2.0	3.5	2.0
B9539-14	275	92	6	23	62	15	2	6	64	3.4	2.0	4.2	2.0	4.8	2.0
B9540-22	279	84	8	23	57	20	8	5	65	2.6	2.0	3.1	2.0	3.8	2.0
B9540-24	245	83	11	23	58	20	4	5	68	2.2	2.0	2.8	2.0	3.6	2.0
Russette	260	89	4	24	57	20	7	6	73	3.0	2.0	3.3	2.1	4.0	2.0
LSD .05	46								3.8						

<sup>1</sup>1 = poor; 9 = outstanding.

<sup>2</sup>1.0 omitted.

<sup>3</sup>French fry color: 1-3 satisfactory.

<sup>4</sup>Texture: 1-2 = satisfactory.



BARC Table 9. Yield, tuber size, distribution, and quality characteristics of clones harvested 84 days after planting on Echo Lake, 1983.

Pedigree	Mkt Cwt	Mkt %	% Tuber Size Distribution							Tuber Rating <sup>1</sup>	Sp. Gv. <sup>2</sup>	50°F			French Fry		
			1-7/8"-2-1/4"-3-1/4"->4"									2 mos.			45°F direct		
			<1-7/8"	1-7/8"	2-1/4"	3-1/4"	4"	>4"	Col <sup>3</sup>			Tex <sup>4</sup>	3 weeks Tex <sup>4</sup>	Col <sup>3</sup>	Tex <sup>4</sup>	3 weeks Tex <sup>4</sup>	
B9540-27	218	84	15	38	56	5	1	6	63	2.8	2.0	3.0	2.1	4.0	2.0		
B9450-29	281	84	11	24	56	21	5	6	73	1.8	1.8	2.9	2.2	3.8	2.1		
B9540-53	255	82	15	26	52	22	3	5	70	2.3	2.0	3.1	2.0	3.4	2.0		
B9540-55	249	81	10	29	50	21	9	5	65	2.1	2.1	3.3	2.0	3.9	2.0		
B9450-62	257	77	8	27	51	22	12	5	64	2.2	1.9	4.0	2.0	4.6	2.0		
B9553-6	238	83	15	34	53	14	2	4	73	2.2	1.9	3.4	2.0	4.6	2.0		
B9562-17	256	86	8	17	62	22	7	5	65	3.1	2.2	3.9	2.0	4.4	2.0		
B9563-2	279	83	6	18	58	24	11	5	71	3.7	2.5	4.4	2.0	5.0	2.0		
B9569-2	238	80	13	37	56	6	7	5	73	3.5	2.1	4.2	2.1	4.9	2.0		
B9585-4	213	88	8	23	64	14	4	5	75	2.5	1.5	3.1	2.6	4.8	2.1		
B9596-2	303	90	8	26	56	18	3	7	74	3.7	1.7	3.8	2.0	4.8	2.1		
B9606-9	233	85	13	29	57	14	2	4	80	2.6	2.1	3.2	1.9	3.8	2.0		
B9606-12	206	83	12	33	51	17	5	5	79	3.9	2.0	3.4	2.1	4.3	2.1		
B9606-15	221	84	16	34	51	15	-	4	77	2.3	2.0	2.5	1.9	3.3	1.9		
B9638-5	162	88	9	15	71	14	3	6	78	1.7	2.0	2.9	2.0	3.9	2.0		
BelRus	209	86	14	39	54	7	-	6	78	2.5	1.8	4.1	1.8	4.5	2.0		
LSD .05	47								4.2								

- See footnotes Table 8.

1 2 3 4



BARC Table 10. Yield, tuber size, distribution, and quality characteristics of clones harvested 84 days after planting on Echo Lake, 1983.

Pedigree	Mkt Cwt	%	% Tuber Size Distribution					Tuber Rating <sup>1</sup>	Sp. Gv. <sup>2</sup>	French Fry					
			1-7/8"- 2-1/4"- 3-1/4"- 4"- >4"							50°F 2 mos. Col <sup>3</sup> Tex <sup>4</sup> 45°F direct 5 mos. Col <sup>3</sup> Tex <sup>4</sup> 40°- 70°F 3 weeks Col <sup>3</sup> Tex <sup>4</sup>					
			<1-7/8"	2-1/4"	3-1/4"	4"	>4"			2 mos. Col <sup>3</sup> Tex <sup>4</sup>	5 mos. Col <sup>3</sup> Tex <sup>4</sup>	40°- 70°F 3 weeks Col <sup>3</sup> Tex <sup>4</sup>			
B9648-9	258	88	11	38	51	12	2	6	66	2.2	2.1	3.3	2.0	4.6	2.0
B9582-18	283	86	8	27	65	8	7	6	81	2.6	2.0	2.3	1.9	3.1	2.0
B9718-5	224	87	10	33	51	17	4	4	66	2.9	2.0	3.4	2.0	3.9	2.0
B9720-3	289	88	8	32	47	21	4	6	72	3.2	1.3	3.8	2.2	4.6	2.1
B9724-16	221	85	10	27	54	19	4	4	69	3.3	2.2	4.5	2.1	4.9	2.1
B9725-1	246	83	6	36	49	14	2	3	68	2.7	2.6	3.1	2.3	4.1	2.4
B9735-1	279	80	13	26	59	16	6	4	68	2.6	2.4	3.5	2.0	4.7	2.0
B9735-8	194	80	20	42	48	10	-	4	63	3.3	2.5	4.0	2.0	4.3	2.0
B9738-3	221	86	8	27	50	24	6	3	72	2.7	1.5	3.0	1.9	4.1	2.0
B9740-1	218	86	10	31	54	14	2	5	69	3.3	1.7	3.7	2.3	4.1	2.3
B9740-4	217	84	16	48	42	10	-	4	73	3.1	1.9	3.6	2.1	4.1	2.1
B9744-1	249	86	14	35	53	12	-	5	72	2.5	1.8	3.6	2.1	4.6	2.1
B9752-7	240	81	15	45	45	10	3	5	67	2.4	2.0	3.7	2.1	4.0	2.0
B9762-1	250	88	11	34	47	19	1	6	71	3.7	2.0	4.5	2.0	5.0	2.1
GoldRus	222	82	18	46	45	9	-	5	71	1.8	1.7	3.4	2.0	4.0	2.0
LSD	51								4.1						

1 2 3 4 - See footnotes Table 8.

## INTER-REGIONAL POTATO INTRODUCTION PROJECT (IR-1)

R. W. Ross and R. E. Hanneman, Jr.

### Introduction of New Stocks

Two hundred sixteen accessions of which 209 were in the form of true seed were added to the collection. Nearly all were acquired from two 1983 expeditions, one collecting in Argentina (110 accessions) and another in Mexico (94 accessions).

### Preservation and Increase of Stocks

Approximately 90% of the introductions contained in the collection are maintained as true seed. Satisfactory seed increases of 147 species introductions and intraspecific hybrids were obtained under glass, fiberglass or screen. Recently harvested seed samples of 124 species introductions were packaged for storage in the National Seed Storage Laboratory. Germination percentages of 984 seed lots 2-22 years of age were determined.

Fifty-two introductions were placed into meristem culture of which 50 were heat treated as tubers of plants. Twenty-six PVX and PVS free lines were found, bringing the total number of meristem-derived virus-free lines to 47. One hundred and eighty-nine plants, consisting of meristem regenerants and clonal lines, were tested serologically for PVX and PVS using the latex agglutination technique (LAT). Five hundred and twenty-eight tests for potato spindle tuber viroid (PSTV) were made by polyacrylamide gel electrophoresis on the true seed increase and related preliminary experiments. Three families from the 1983 true seed increase that flowered poorly and 45 foreign variety and species clones were placed into shoot-tip culture. A long-term storage protocol for in vitro preservation of clonal stocks was adapted from that used by Dr. G. Mix, FAL, Braunschweig, West Germany, with the German-Dutch Collection clonal collection.

### Classification

One hundred ten herbarium specimens were prepared from 52 recent Bolivian, Mexican and Peruvian species accessions, and forwarded at the request of Solanum taxonomist C. M. Ochoa, Peru, for use in classification studies. A total of 239 herbarium species were collected at 123 sierra sites across several Mexican states for inclusion in the IR-1 herbarium. More than 4,000 herbarium mounts representing specific and interspecific variability of 111 species are now available for taxonomic use.

## Distribution of Stocks

Seed and tuber shipments were sent to potato workers in 24 states within this country, as well as to 16 other countries, in response to requests. Shipments included 3,435 seed and 1,516 tuber samples of species introductions, and six seed and 124 tuber samples of germplasm involving species introductions developed by the cooperative USDA-Wisconsin Genetics and Cytogenetics Project.

Copies of a listing of 226 species introductions available this year in the form of tuber families as well as true seed were distributed to 307 potato workers. This mailing elicited 26 responses that depleted all of the tuber families offered.

## Evaluation of Stocks

The more recent accessions are being steadily evaluated for characters of economic importance through the cooperative efforts of state, federal, and foreign laboratories. In addition, Special Grant funds from USDA, CSRS and funding from USDA, ARS have been received specifically to aid in screening for high priority characters chosen by the Potato Crop Advisory Committee. As a result, 4506 accessions are being tested for potato leafroll virus (PLRV), Colorado potato beetle and/or Verticillium wilt resistance. In addition, the entire seed and clonal collection has been screened (over 7100 tests) for the presence of the potato spindle tuber viroid (PSTV) as a preventive measure.

## Usefulness of Findings

The major objective of the Inter-Regional Potato Introduction Project is to promote and facilitate the improvement of the commercial potato in the United States by providing a readily available reservoir of useful breeding stocks. Breeders are constantly searching for new sources of superior germplasm and for ways to incorporate desirable new genes into adapted commercial varieties. Accomplishment of the major objective of this program must be measured largely by the success with which new, improved varieties meet the needs of commercial production.

Five new potato varieties, Chipbelle, Islander, Redsen, Yankee Chipper and Yankee Supreme, were released for commercial production in 1982-83. The number of foreign introductions entering into their pedigrees are 10, 12, 9, 11 and 10, respectively. One hundred fifty-nine of the 163 potato varieties developed and released in the United

States since 1932 have two or more foreign introductions in their pedigree. These varieties presently comprise about 65% of the annual seed potato production in the United States.

Basic research programs conducted in several states and other countries continue to provide information concerning the potential value and diversity of the Solanum species, and consequently the knowledge necessary for more effective utilization of the IR-1 germplasm collection. During 1983 44 papers, 15 abstracts, and 12 theses reported the use of Solanum introductions.

# NORTH CENTRAL REGIONAL POTATO TRIALS

R.H. Johansen and Cooperators<sup>1/</sup>

## Potato Cultivar Trials

The year 1983 was the 33rd year that the North Central Regional Trials have been conducted. Participating in the trials were 13 States and two Canadian Provinces; however, four trials were lost due to drought and poor weather conditions and one trial was neglected and not planted. Michigan dropped out of the 1983 trial. This resulted in only 10 locations reporting data for 1983.

Potato cultivars released in 1983 were:

### REDSSEN

Progeny Number: ND146-4R

Released By: North Dakota

Parentage: ND8973-3R x ND9403-20R

### RED CLOUD

Progeny Number: Neb. 143.70-2

Released By: Nebraska

Parentage: Superior x Neb. 185.57-1

Cooperating States and Provinces:

State or Province	Date Planted	Date Harvested	Total Days to Harvest
Alberta	5/5	9/23	132
Manitoba	5/11	9/12	131
Colorado	5/10	9/10	124
Indiana*	--	--	--
Iowa	4/20	8/16	119
Kansas*	--	--	--
Kentucky	4/19	NDR**	NDR**
Louisiana*	--	--	--
Minnesota***	--	--	--
Missouri*	--	--	--
Nebraska	5/18	9/23	129
North Dakota	5/17	9/26	115
Ohio	5/11	9/27	125
South Dakota	5/16	9/26	119
Wisconsin	5/6	9/26	130

\*No data reported; \*\*Trial lost due to drought and poor weather conditions; \*\*\*Trial not planted.

<sup>1/</sup> Kansas, Dr. J.K. Greig; Louisiana, Dr. James Fontenot; Michigan, Dr. Richard Chase; Minnesota, Dr. Florian Lauer; Missouri, Dr. V.N. Lambeth; Nebraska, Dr. R.B. O'Keefe; Ohio, Mr. E.C. Wittmeyer; South Dakota, Dr. Paul Prashar; Wisconsin, Mr. Donald Kichefski; Alberta, Mr. Steve Molnar; Manitoba, Mr. J. Tom Gonsalves; Indiana, Dr. Homer Erickson; Iowa, Dr. Bill Summers; Colorado, Mr. Elmer Rothman; Kentucky, Dr. John Snyder.



Environmental Conditions. Soil type ranged from clay loam to sand. Most trials were planted on sandy or silt loams.

Cultural Practices. Fertilizer, fungicides, insecticides, vine killers, herbicides, etc. were based on local conditions. Herbicides commonly used were Eptam, Sencor, Poast, Lexone, Lasso and Lorox. Insecticides used were Furdan, Thiodan, Belmark, Phydrin, Thimet, Sevin, Diazinon, Di-syston, Phosphamidan, Pounce and Guthion. Fungicides commonly used were Difolatan, Dithane, M 45, MF-4, Bravo, Duter, Manzate and Sulfur. Vines were killed by Reglone, Diquat and mechanical.

Weather and Growing Conditions. The 1983 season was a disaster for Indiana, Kansas, Louisiana, and Missouri. All of these states lost their trial due to the 1983 drought and other poor weather conditions. Minnesota apparently didn't plant their trial. States and Provinces that did harvest a trial had generally cool weather early in the season but extremely prolonged high temperatures during July and August. Ohio had an unusually wet spring that delayed planting and affected emergence. Alberta, Manitoba, Wisconsin, North Dakota and Nebraska had normal or near normal precipitation during the growing season. South Dakota had ample moisture in June, however it was below normal in July and August. In Colorado, it was cool during May and June and normal during the rest of the season.

Entries. Entries were received from Indiana, Louisiana, Minnesota, Nebraska, North Dakota and Wisconsin. North Dakota supplied the check cultivars Norland, Red Pontiac, Norchip, Russet Burbank and Norgold Russet.

Total and U.S. No. 1 Yield. Red Pontiac was again the highest yielding entry in both total and U.S. No. 1 yield. The next highest yielding entries were ND534-4Russ and ND388-1Russ. Alberta reported the highest yield with an average yield for all entries of 458 cwt per acre, followed by Wisconsin with a 420 cwt per acre average. Total and U.S. No. 1 yield are found in North Central Regional Tables 1 and 2.

Percent U.S. No. 1. Wisconsin reported the highest and Iowa reported the lowest percent U.S. No. 1. Russet Burbank with an overall average of 52.2% U.S. No. 1 was the lowest entry in trial. For this cultivar, growth cracks, second growth and generally just poor shaped tubers account for the low percent U.S. No. 1 grade (North Central Regional Table 3).

Maturity. Norland was the earliest maturing entry in trial, while Russet Burbank was the latest. Maturity data is found in North Central Regional Table 4.

Percent Total Solids. The highest percent total solids were found with Wisc. 842 while the lowest was with Norland and Red Pontiac (North Central Regional Table 5). Other entries producing high total solids were Wisc. 752, Neb. Al31-4 and Minn. 10162. High total solids were also reported for Wisc. 752 in last years trial. Alberta reported the highest and Iowa the lowest percent total solids.

Scab Reaction. North Dakota and Nebraska reported the highest incidence of scab. Several locations reported little or no scab (North Central Regional Table 6).

Summary of Grade Defects. Russet Burbank had 32.5 percent second growth while several other selections had a high incidence of scab, growth cracks, second growth, internal and vascular discoloration (North Central Regional Table 7). Again, certain entries are starred (\*) to point out various internal and external defects.

Chip Quality. Chip scores, either Agtron or PCII Color Chart scores are found in North Central Table 8. All three Wisconsin entries and Ind. 78-59-1, MN 10162 and Neb. A 131-4 seemed to be potential chippers.

Early Blight Readings. Early blight readings are found in North Central Table 9. All entries seemed to have about the same degree of resistance or susceptibility.

Overall Merit Ratings<sup>1/</sup>. Merit ratings are presented for 1983 in North Central Table 10. The highest merit rating was found for ND534-4Russ. This selection was also the top entry in 1982. In the same trials, ND388-1Russ was third in 1982 and second in 1983. The following entries received the highest merit points in 1981, 1982 and 1983:

<u>Cultivar or Selection</u>	<u>1981</u>	<u>1982</u>	<u>1983</u>
ND534-4Russ		41	24
ND388-1Russ		24	20
Wisc. 842			16
La. 01-38			15
Red Pontiac	6	5	14

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1/ Merit Ratings

<u>Rating</u>	<u>Points</u>
1	5
2	4
3	3
4	2
5	1

North Central Regional Table 1. Total Yield (Cwt/Acre) - 1983.

Cultivar or Selection	Alb.	Man.	Co.	Iowa	Kent.	Neb.	N. Dakota	Ohio	S. Dakota	Wisc.	Average
<u>Early to Medium Early</u>											
Norland	591	191	374	251	98	194	284	207	287	365	284.2
<u>Medium to Late</u>											
Ind. 78-59-1	231	172	325	188	123	95	200	154	218	307	172.3
La. 82-119	284	238	411	174	148	189	314	156	176	472	256.2
La. 01-38	108	187	445	231	221	179	285	226	267	410	255.9
MN 10162	183	169	382	112	119	165	195	208	145	334	201.2
MN 10874	334	192	425	125	120	184	246	197	111	352	228.6
MN 11553	369	270	406	163	117	250	251	200	243	472	231.8
Neb. A131-4	530	165	314	90	80	104	157	106	87	310	194.3
Neb. A69.72-2	534	159	370	163	129	191	228	168	98	410	245.0
Neb. A153.69-2	613	145	408	144	100	157	174	152	136	405	243.4
ND388-1Russ	638	231	377	238	192	160	273	176	247	358	274.6
ND534-4Russ	737	210	450	258	172	242	194	191	218	432	310.4
ND372-2R	645	238	431	254	202	162	258	181	203	461	303.5
Wisc. 752	277	207	447	230	205	188	208	167	187	450	256.6
Wisc. 779	402	159	479	231	185	289	239	193	187	474	283.8
Wisc. 842	261	152	335	191	172	192	228	197	169	441	233.8
Red Pontiac	832	237	578	202	228	355	318	280	299	546	387.5
Norchip	360	230	415	219	142	280	312	194	198	441	258.4
Russet Burbank	697	191	438	120	180	219	208	175	187	512	281.9
Norgold Russet	529	229	438	124	120	279	255	196	149	443	236.3
Average	458	199	412	185	153	208	241	187	191	420	257.0



North Central Regional Table 2. U.S. No. 1 Yield (Cwt/Acre) - 1983.

Cultivar or Selection	Alb.	Man.	Co.	Iowa	Kent.	Neb.	N. Dakota	Ohio	S. Dakota	Wisc.	Average
<u>Early to Medium Early</u>											
Norland	468	161	271	132	72	127	248	163	245	343	223.0
<u>Medium to Late</u>											
Ind. 78-59-1	182	144	255	136	99	71	126	129	192	298	163.2
La. 82-119	217	197	253	20	101	117	273	100	142	405	182.5
La. 01-38	84	142	361	140	182	107	270	179	218	394	207.7
MN 10162	140	122	253	17	87	88	133	154	107	312	141.3
MN 10874	279	158	349	17	72	121	211	157	82	329	177.5
MN 11553	297	220	277	43	80	134	189	164	183	437	202.4
Neb. A131-4	414	124	196	16	48	51	128	50	65	261	135.3
Neb. A69.72-2	430	131	252	78	112	78	168	104	87	392	183.2
Neb. A153.69-2	485	119	279	38	72	96	144	97	116	387	183.3
ND388-1Russ	493	206	303	55	166	120	205	120	198	338	193.4
ND534-4Russ	497	148	333	110	152	164	153	122	169	405	225.3
ND372-2R	487	189	307	151	135	98	229	134	163	436	220.9
Wisc. 752	211	144	285	43	115	143	168	111	154	419	179.3
Wisc. 779	307	124	324	85	126	140	152	150	161	452	202.1
Wisc. 842	188	118	233	73	117	124	182	140	132	423	173.0
Red Pontiac	659	212	466	101	186	100	268	207	261	532	299.2
Norchip	249	192	274	79	104	147	200	134	165	417	176.3
Russet Burbank	469	131	233	0	130	70	108	58	113	468	178.0
Norgold Russet	377	182	331	42	87	201	169	145	100	397	203.1
Average	347	158	287	69	112	115	186	126	153	392	192.5

North Central Regional Table 3. Average Percent U.S. No. 1 (over 2" Diameter) - 1983.

Cultivar or Selection	Alb.	Man.	Co.	Iowa	Kent.	Neb.	N. Dakota	Ohio	S. Dakota	Wisc.	Average
<u>Early to Medium Early</u>											
Norland	79	84	73	53	73	66	87	79	85	94	67.8
<u>Medium to Late</u>											
Ind. 78-59-1	83	84	78	72	80	74	63	84	88	97	80.3
La. 82-119	76	83	62	11	68	62	87	64	81	86	68.0
La. 01-38	78	76	83	60	82	60	95	79	89	96	79.8
MN 10162	76	72	67	15	73	53	68	74	74	93	66.5
MN 10874	83	82	76	14	60	66	86	80	74	93	71.4
MN 11553	80	82	69	26	68	54	75	82	75	93	70.4
Neb. A131-4	78	75	63	18	60	50	82	47	75	84	63.2
Neb. A69.72-2	81	82	68	48	87	41	74	62	89	96	72.8
Neb. A153.69-2	79	82	68	26	72	49	83	64	85	96	70.4
ND388-1Russ	77	89	80	23	87	75	75	68	80	94	74.8
ND534-4Russ	67	71	71	43	88	68	79	64	78	94	72.3
ND372-2R	75	79	71	60	67	61	89	74	80	95	67.9
Wisc. 752	76	70	64	19	56	76	81	66	82	93	68.3
Wisc. 779	76	78	68	37	68	49	64	78	86	95	69.9
Wisc. 842	72	78	70	38	68	65	80	71	78	96	64.4
Red Pontiac	79	90	81	50	82	28	84	74	87	97	75.2
Norchip	69	84	67	36	73	53	64	69	83	95	69.3
Russet Burbank	67	69	53	0	72	32	52	22	60	95	52.2
Norgold Russet	71	80	76	19	72	72	66	74	67	96	69.3
Average	76	80	70	33	73	56	77	69	80	93	69.7

North Central Regional Table 4. Maturity Classification<sup>1/</sup> - 1983.

Cultivar or Selection	Alb.	Man.	Co.	Iowa	Kent.	Neb.	N. Dakota	Ohio	S. Dakota	Wisc.	Average
Early to Medium Early											
Norland	3.0	2.0	ND	1.0	1.0	2.5	2.0	2.0	1.0	1.5	1.8
Medium to Late											
Ind. 78-59-1	4.5	2.5	ND	3.0	5.0	3.5	3.0	3.0	3.0	3.5	3.4
La. 82-119	3.5	4.0	ND	3.0	4.0	2.3	4.3	3.0	2.0	3.5	3.3
La. 01-38	5.0	3.5	ND	4.0	5.0	2.5	4.8	3.0	5.0	2.0	3.9
MN 10162	4.0	3.0	ND	3.0	5.0	2.0	3.8	3.0	3.0	3.0	3.3
MN 10874	4.0	3.0	ND	3.0	5.0	3.0	3.3	3.0	4.0	4.0	3.6
MN 11553	3.5	3.0	ND	3.0	2.0	2.8	4.0	2.0	1.0	2.5	2.6
Neb. A131-4	4.0	4.5	ND	3.0	1.0	2.0	4.0	2.0	3.0	4.0	3.1
Neb. A69.72-2	4.0	3.0	ND	3.0	4.0	2.5	4.3	3.0	3.0	4.5	3.5
Neb. A153.69-2	4.0	4.0	ND	3.0	4.0	2.0	4.5	3.0	2.0	4.0	3.4
ND388-1Russ	4.0	3.0	ND	3.0	4.0	3.0	4.0	2.0	3.0	5.0	3.4
ND534-4Russ	3.5	3.0	ND	3.0	3.0	2.8	4.0	2.0	2.0	3.0	2.9
ND372-2R	3.5	3.0	ND	3.0	2.0	2.0	3.0	1.0	2.0	3.0	2.5
Wisc. 752	5.0	4.0	ND	4.0	5.0	2.5	3.8	3.0	4.0	4.0	3.9
Wisc. 779	4.0	4.0	ND	4.0	5.0	2.8	3.8	3.0	5.0	5.0	4.1
Wisc. 842	5.0	4.0	ND	4.0	5.0	3.3	3.8	4.0	4.0	5.0	4.2
Red Pontiac	4.5	4.5	ND	3.0	5.0	3.0	4.0	3.0	3.0	4.0	3.8
Norchip	4.0	2.5	ND	3.0	4.0	2.5	3.0	3.0	4.0	4.0	3.3
Russet Burbank	4.5	4.5	ND	5.0	5.0	2.8	5.0	4.0	5.0	5.0	4.5
Norgold Russet	3.0	3.0	ND	3.0	3.0	2.0	3.0	2.0	3.0	3.5	2.8
Average	4.0	4.5	ND	3.2	3.9	2.6	3.8	2.7	3.1	3.7	3.4
1/ 1. Very early - Norland Maturity											
2. Early - Irish Cobbler Maturity											
3. Medium - Red Pontiac Maturity											
4. Late - Katahdin Maturity											
5. Very Late - Russet Burbank Maturity											
ND - No data											

North Central Regional Table 5. Percent Total Solids - 1983

Cultivar or Selection	Alb.	Man.	Co.	Iowa	Kent.	Neb.	N. Dakota	Ohio	S. Dakota	Wisc.	Average
<u>Early to Medium Early</u>											
Norland	18.5	19.4	12.0	11.2	15.6	11.8	16.5	17.5	15.1	14.3	15.2
<u>Medium to Late</u>											
Ind. 78-59-1	22.5	22.6	16.7	12.9	18.9	22.0	18.8	20.4	18.2	19.2	19.2
La. 82-119	24.8	22.2	16.5	12.4	20.2	20.7	18.8	21.1	18.9	18.4	19.4
La. 01-38	20.1	21.8	16.5	13.6	17.8	21.6	19.4	18.1	18.2	19.7	18.7
MN 10162	24.0	23.7	17.3	14.5	21.0	21.6	20.9	19.0	19.1	19.4	20.1
MN 10874	22.8	21.3	16.7	12.7	19.9	20.3	19.0	28.9	16.3	18.0	19.6
MN 11553	21.4	19.6	13.5	13.3	17.2	17.7	17.3	19.0	16.3	15.8	17.1
Neb. A131-4	24.5	23.9	16.5	15.4	20.6	22.7	19.9	19.2	19.6	19.4	20.2
Neb. A69.72-2	22.3	21.3	14.8	11.8	19.1	19.7	17.3	19.2	17.3	18.2	18.1
Neb. A153.69-2	22.7	20.4	13.5	12.3	17.8	18.2	18.6	17.9	16.7	17.3	17.5
ND388-1Russ	22.8	21.8	15.4	13.0	18.3	19.4	17.7	20.2	18.0	17.5	18.4
ND534-4Russ	21.4	21.4	14.3	12.9	18.9	19.4	17.1	20.4	17.3	17.3	18.5
ND372-2R	22.0	21.8	15.8	13.9	19.5	20.1	19.0	19.0	17.8	18.2	18.7
Wisc. 752	24.2	24.7	19.2	15.4	20.6	22.7	22.0	20.2	20.8	21.8	21.1
Wisc. 779	20.8	22.0	15.6	16.9	19.7	19.0	15.8	19.2	17.3	18.6	18.5
Wisc. 842	24.5	24.9	25.5	17.3	20.8	24.0	21.8	20.6	19.6	22.4	22.1
Red Pontiac	20.0	18.9	13.5	11.5	15.7	10.8	17.3	16.0	15.1	16.0	15.5
Norchip	23.0	21.7	17.5	14.1	20.2	20.3	19.4	20.2	16.8	19.2	19.2
Russet Burbank	23.5	21.4	16.9	14.2	17.2	19.9	18.8	19.2	17.1	19.2	18.7
Norgold Russet	21.0	20.9	15.0	11.9	18.1	19.4	17.1	19.2	16.0	16.7	17.5
Average	22.4	21.8	15.3	13.6	18.9	19.6	16.8	18.8	17.6	18.3	18.7

North Central Regional Table 6. Scab Reaction Report. Most Representative Scab (Area-Type)<sup>1/</sup> - 1983.

Cultivar or Selection	Alb.	Man.	Co.	Iowa	Kent.	Neb.	N. Dakota	Ohio	S. Dakota	Wisc.
Early to Medium Early										
Norland	0-0	1-1	-2	T-0	T-1	1-1	2-3	T-1	T-0	0-0
Medium to Late										
Ind. 78-59-1	0-0	T-2	0-0	T-0	1-3	0-0	T-1	T-1	T-0	0-0
Ia. 82-119	0-0	T-1	-2	T-0	T-1	T-2	2-2	T-1	T-0	0-0
Ia. 01-38	0-0	1-2	-2	T-0	1-1	T-3	1-2	T-1	T-0	2-3
MN 10162	0-0	1-1	-5	1-3	1-1	1-3	T-1	T-1	T-0	3-3
MN 10874	0-0	1-1	0-0	T-0	T-1	0-0	0-0	T-1	T-0	0-0
MN 11553	0-0	1-2	-3	T-0	1-1	1-2	3-5	T-1	T-0	0-0
Neb. A131-4	0-0	1-2	0-0	1-1	T-1	T-2	4-3	T-1	T-0	0-0
Neb. A69.72-2	0-0	1-1	0-0	T-0	T-1	T-4	0-0	T-1	T-0	0-0
Neb. A153.69-2	0-0	1-2	0-0	T-0	1-3	0-0	T-1	T-1	T-0	0-0
ND388-1Russ	0-0	T-1	0-0	T-0	T-1	0-0	0-0	T-1	T-0	0-0
ND534-4Russ	0-0	T-1	0-0	T-0	T-1	1-4	0-0	T-1	T-0	0-0
ND372-2R	0-0	T-1	-4	T-0	T-1	2-4	2-1	T-1	T-0	0-0
Wisc. 752	0-0	T-1	0-0	T-0	T-1	T-4	T-1	T-1	T-0	0-0
Wisc. 779	0-0	0-0	0-0	T-0	T-3	T-1	0-0	T-1	T-0	0-0
Wisc. 842	0-0	T-2	0-0	T-0	T-1	1-4	T-1	T-1	T-0	0-0
Red Pontiac	0-0	T-2	0-0	T-0	T-1	1-4	2-3	T-1	T-0	0-0
Norchip	0-0	T-1	-1	T-0	T-1	2-2	T-1	T-1	T-0	0-0
Russet Burbank	0-0	0-0	0-0	T-0	T-1	0-0	0-0	T-1	T-0	0-0
Norgold Russet	0-0	1-1	0-0	T-0	T-1	T-4	0-0	T-1	T-0	0-0

1/ AREA	TYPE
T = less than 1%	1 - Small, superficial
1 = 1-20%	2 - Larger, superficial
2 = 21-40%	3 - Larger, rough pustules
3 = 41-60%	4 - Larger pustules, shallow eyes
4 = 61-80%	5 - Very large pustules, deep holes

North Central Regional Table 7. Summary of Grade Defects - 1982.

Cultivar or Selection	External				Internal			
	Scab	Growth Cracks	Second Growth	Sun Green	Total Free of 1/ Ext. Defects	Hollow Heart	Internal Necrosis	Total Vascular Discolora- tion Free of Int. Defects
<u>Early to</u>								
<u>Medium Early</u>								
Norland	10.4	8.2	1.9	1.2	87.1	0.6	0.6	5.1 93.9
<u>Medium to Late</u>								
Ind. 78-59-1	6.2	3.3	0.8	2.4	89.7	0.6	8.2*	15.3* 73.1
La. 82-119	4.7	2.7	5.8	1.1	89.0	0.8	0.6	6.8 91.9
La. 01-38	26.2*	5.1	2.2	2.6	86.6	0.7	0.3	8.8 91.1
MN 10162	19.1*	4.1	9.7*	2.6	73.6	0.0	1.1	11.9 88.1
MN 10874	1.0	1.4	4.7	0.8	94.3	0.9	5.2	6.9 87.1
MN 11553	16.2*	9.4*	2.5	0.0	79.0	0.6	4.0	3.6 91.6
Neb. A131-4	11.1	5.9	2.5	0.9	85.1	1.3	1.1	13.1 75.2
Neb. A69.72-2	5.2	5.7	7.7*	1.0	87.4	2.2	1.1	10.6 86.0
Neb. A153.69-2	9.0	10.3*	2.4	1.6	84.8	0.9	2.4	11.8 85.7
ND388-1Russ	1.1	2.8	5.2	0.2	92.8	2.5	1.7	7.0 89.6
ND534-4Russ	0.9	1.1	6.7	0.6	93.6	2.7	1.6	6.2 89.1
ND372-2R	8.8	4.2	2.3	0.9	89.8	1.2	0.2	5.9 92.9
Wisc. 752	4.9	2.4	3.6	1.6	92.0	0.5	0.1	6.6 93.0
Wisc. 779-	0.6	11.0	7.8*	0.8	86.6	4.6*	0.0	15.3* 80.1
Wisc. 842	3.2	0.9	2.0	1.7	84.1	3.6*	3.2	8.3 86.6
Red Pontiac	8.6	9.3*	8.2*	0.8	83.1	0.8	0.0	10.3 86.6
Norchip	4.0	6.0	8.8*	6.0*	84.6	0.6	6.9	4.9 86.5
Russet Burbank	0.0	3.0	32.5*	0.8	70.1	2.8	3.6	7.4 86.8
Norgold Russet	6.2	4.8	7.8	0.9	86.9	3.2*	1.4	5.2 91.5

1/ Percent normal tubers showing no defects (some individuals had more than one type of defect).

\* Possible weakness of cultivar or clone.

North Central Regional Table 8. Chip Quality - 1983.

Cultivar or Selection	2/ Alb.	2/ Man.	1/ Co.	Iowa	1/ Neb.	2/ Kent.	2/ N.Dakota	1/ Ohio	3/ S.Dakota	1/ Wisc.
Early to Medium Early										
Norland	21	36	6.3	5	2	49	35	1	ND	7.0
Medium to Late										
Ind. 78-59-1	31	43	3.3	2	1	56	36	1	ND	3.6
La. 82-119	22	31	3.5	8	2	53	24	2	ND	5.5
La. 01-38	15	37	3.0	2	2	64	39	2	ND	4.4
MN 10162	41	53	3.2	5	3	56	39	2	ND	3.9
MN 10874	20	26	5.0	6	3	44	15	3	ND	8.0
MN 11553	22	35	8.0	6	3	49	37	3	ND	6.4
Neb. Al31-4	43	54	2.3	6	2	54	37	2	ND	3.7
Neb. A69.72-2	16	24	6.5	9	3	40	17	4	ND	7.0
Neb. Al53.69-2	17	23	3.6	ND <sup>3/</sup>	4	47	22	3	ND	5.4
ND388-1Russ	24	38	2.7	6	3	56	29	2	ND	4.5
ND534-4Russ	14	27	4.2	4	3	58	27	2	ND	6.0
ND372-2R	19	39	5.8	7	3	56	28	1	ND	8.0
Wisc. 752	34	40	2.3	5	2	58	34	2	ND	4.3
Wisc. 779	31	43	2.3	7	1	58	36	2	ND	3.8
Wisc. 842	42	47	1.7	3	1	60	34	2	ND	3.1
Red Pontiac	14	29	9.0	7	4	48	21	3	ND	9.0
Norchip	41	43	1.8	5	2	55	41	1	ND	3.5
Russet Burbank	30	34	4.7	7	3	52	30	3	ND	5.7
Norgold Russet	18	27	7.5	4	5	37	22	3	ND	10.0
Average	26	36	4.3	5.2	2.6	53	30	2.2	ND	7.8

1/ PCII Color Chart (1 lightest; 10 darkest)

2/ Agtron (Highest number lightest)

3/ No data reported



North Central Regional Table 9. Early Blight<sup>1/</sup> - 1983.

Cultivar or Selection	Alb.	Man. <sup>2/</sup>	Co.	Iowa <sup>2/</sup>	Kent.	Neb.	N. Dakota	Ohio <sup>2/</sup>	S. Dakota <sup>2/</sup>	Wisc.	Average
<u>Early to</u>											
<u>Medium Early</u>											
Norland	5	ND	3	ND	1	3.5	0	ND	ND	3.0	2.6
<u>Medium to Late</u>											
Ind. 78-59-1	5	ND	5	ND	1	4.0	0	ND	ND	0	2.5
Ia. 82-119	5	ND	4	ND	1	4.0	0	ND	ND	0	2.3
Ia. 01-38	5	ND	2	ND	1	3.8	0	ND	ND	0	2.0
MN 10162	5	ND	5	ND	1	4.0	0	ND	ND	0	2.5
MN 10874	5	ND	5	ND	1	3.5	0	ND	ND	0	2.4
MN 11553	5	ND	5	ND	1	3.8	0	ND	ND	0	2.5
Neb. A131-4	5	ND	5	ND	1	4.0	0	ND	ND	0	2.5
Neb. A69.72-2	5	ND	2	ND	1	3.8	0	ND	ND	0	2.0
Neb. A153.69-2	5	ND	2	ND	1	4.8	0	ND	ND	0	2.1
ND388-1Russ	5	ND	2	ND	1	3.3	0	ND	ND	0	1.9
ND534-4Russ	5	ND	5	ND	1	3.3	0	ND	ND	0	2.4
ND372-2R	5	ND	5	ND	1	4.5	0	ND	ND	0	2.6
Wisc. 752	5	ND	5	ND	1	4.0	0	ND	ND	0	2.5
Wisc. 779	5	ND	5	ND	1	4.3	0	ND	ND	0	2.6
Wisc. 842	5	ND	5	ND	1	3.3	0	ND	ND	0	2.4
Red Pontiac	5	ND	5	ND	1	3.0	0	ND	ND	3.0	2.8
Norchip	5	ND	2	ND	1	3.8	0	ND	ND	0	2.0
Russet Burbank	5	ND	5	ND	1	3.3	0	ND	ND	0	2.4
Norgold Russet	5	ND	5	ND	1	4.3	0	ND	ND	0	2.6
Average	5	ND	4.1	ND	1	3.8		ND	ND	0.3	2.4

1/ Early Blight; 1 susceptible; 5 highly resistant; 0 no disease

2/ No data reported (ND)



North Central Regional Table 10. Merit Ratings<sup>1/</sup> - 1983.

Cultivar or Selection	Alb.	Man.	Co.	Iowa	Kent.	Neb.	N. Dakota	Ohio	S. Dakota	Wisc.	Total Points
<u>Early to Medium Early</u>											
Norland		1		1				3	3		8
<u>Medium to Late</u>											
Ind. 78-59-1		2	3	2							7
La. 82-119											
La. 01-38				3				5	4		15
MN 10162		2									2
MN 10874							4				4
MN 11553						1		1	1		3
Neb. A131-4											
Neb. A69.72-2											
Neb. A153.69-2											
ND388-1Russ	2	5			4	2	5		2		20
ND534-4Russ	3			5	5	3	3			5	24
ND372-2R	1			4	2		2			3	12
Wisc. 752			5				1			2	8
Wisc. 779			1			4		4		1	10
Wisc. 842			4		1	5		2		4	16
Red Pontiac	5	4							5		14
Norchip		3									3
Russet Burbank	4										4
Norgold Russet											

1/ Merit Ratings

Rating	Points
1	5
2	4
3	3
4	2
5	1

# WESTERN REGIONAL POTATO VARIETY TRIAL - 1983

J. J. Pavek, D.L. Corsini, and Cooperators<sup>1/</sup>

## Uniform Potato Yield Trial

The 1983 trial was grown uniformly at eight locations. It consisted of nine entries, seven experimental and two standard checks. The trial locations, dates of planting, vine killing, and harvest, and days from planting to harvest were as follows:

State/ Province	Location	Planting Date	Vine Kill Date	Harvest Date	Days to Harvest
California	Kern Co.	2/24	6/20	7/ 7	133
"	Tulelake	5/11	9/ 4	9/26	138
Colorado	San Luis Valley	5/19	9/ 5	9/16	120
Idaho	Aberdeen	5/ 9	9/15	10/ 5	149
"	Kimberly	4/26	9/20	10/ 6	163
Oregon	Hermiston	4/ 4	9/23	10/13	192
Washington	Othello	4/21	-	10/ 5	167
Alberta	Vauxhall	5/20	9/14	9/28	131

The trial also was planted in Wyoming and at an additional location each in Oregon and Washington but because of various problems it was not harvested at these three locations.

Cultural practices and the use of fertilizer, herbicides, pesticides, and vine killing varied according to local conditions. Trial plots at all locations were irrigated on a regular schedule throughout the entire growing season according to plant needs. Temperatures across the region averaged below normal during the first half of the growing season and above normal during the remainder. July temperatures in central Idaho were 4.7° below normal and 2.6° above normal in August.

Data on vine and tuber characteristics, yield, internal quality, disease reactions and merit scores are presented in Western Tables 1 through 7. Long russet clones A74133-1 and A74212-1 ranked high in merit scores and will be retained in the 1984 trial as potential fresh market varieties. Blocky russet A72685-2, with the highest merit score, has been in the trial for three years and will not be repeated; it will be further increased in preparation for industry processing trials. NDD47-1 and NDD277-2 continue to show promise in California and will be increased and tested further.

<sup>1/</sup> Alberta, D. Lynch; California, R. Voss, C. Dennett; Colorado, D. Holm; Idaho, G. Kleinschmidt, S. Michener; Oregon, A. Mosley, D. Hane, C. Stanger, G. Carter; Washington, R. Thornton, N. Holstad, M. Martin, W. Iritani; Wyoming, K. Bohnenblust.

Western Table 1. Seed source, stand, vine characteristics, and foliar diseases.

Entry	Seed Source	Stand % (5 loc)	Vine Size $\frac{1}{(2 \text{ loc})}$	Maturity <sup>1/</sup> $\frac{1}{(4 \text{ loc})}$	Verticillium <sup>2/</sup> Wilt $\frac{1}{(ID)} \frac{2}{(WA)}$	Early Blight <sup>2/</sup> (ID)
A69870-3	Or	88	Lrq	3.6	1.7 1.0	6.5
A72685-2	Or, Id	91	Lrq	3.1	2.2 3.2	5.5
A74133-1	Ca	89	Lrg	2.8	1.4 2.8	3.6
A74212-1	Or	92	Lrg	3.1	2.1 3.3	5.9
A75188-3	Id	92	Lrg	3.8	1.3 2.4	3.1
NDD47-1	Ca	88	Lrq	3.0	1.4 2.5	4.4
NDD277-1	Ca	83	Lrg	2.5	1.5 -	3.8
Lemhi Russet	Or, Id	97	Lrg	3.0	1.9 -	5.9
Russet Burbank	Or, Id	96	Lrg	3.3	3.6 4.1	5.9
LSD .05		10		1.0	1.7 -	1.5

<sup>1/</sup> Maturity: 1.0 (Earliest) to 5.0 (Latest)

<sup>2/</sup> Wilt and Blight: 1.0 (least) to 5.0 (most severe).

Western Table 2. Total tuber yield, cwt/acre.

Entry	California Kern	Tul 1/	Colo SLV	Idaho Ab	Kim 1/	Ore Herm 1/	Wash Oth	Alberta Ltbr	Overall <sup>2/</sup> Mean
A69870-3	390	530	377	385	517	741	571	303	502 ab
A72685-2	325	370	417	391	664	808	649	309	518 ab
A74133-1	410	505	396	375	490	594	567	-	477 b
A74212-1	405	675	458	475	684	717	679	447	585 a
A75188-3	400	530	455	411	576	743	671	265	541 ab
NDD47-1	435	520	409	343	558	545	440	-	464 bc
NDD277-1	525	480	335	215	420	487	275	-	391 c
Lemhi Russet	430	510	377	447	491	636	568	319	494 b
Russet Burbank	325	495	398	311	522	644	591	307	469 bc
Location Mean	405	513	402	373	547	657	557	-	493

<sup>1/</sup> Metribuzin used for weed control.

<sup>2/</sup> Alberta location not included in overall mean and AOV, locations used as reps. for Duncan's test ( $P = 0.05$ )

Western Table 3. US No. 1's; percent of total yield for locations; overall mean, percent and cwt/acre.<sup>1/</sup>

Entry	California		Colo SLV	Idaho		Ore Herm	Wash Oth	Alberta Ltbr	Overall	
	Kern	Tul		Ab	Kim				Mean	% cwt/A
A69870-3	88	92	81	87	90	96	79	67	88	442 ab
A72685-2	82	85	88	88	95	94	74	70	87	452 ab
A74133-1	91	90	86	91	92	77	83	-	87	427 ab
A74212-1	91	95	83	93	90	88	66	75	87	504 a
A75188-3	88	89	78	82	83	78	83	85	83	447 ab
NDD47-1	91	77	90	94	90	91	79	-	87	404 bc
NDD277-1	91	95	87	82	85	90	46	-	82	332 c
Lemhi Russet	88	84	71	89	91	90	74	67	84	418 abc
Russet Burbank	62	71	70	71	81	80	58	62	70	332 c
Location Mean	87	87	82	87	89	89	73		85	418

<sup>1/</sup> See Western Table 2 footnote 2/

Western Table 4. U.S. No. 1's over 10 or 12 oz, percent of total yield for locations; overall mean, percent and cwt/acre.

Entry	California		Colo SLV	Idaho		Ore Herm	Wash Oth	Albarta Ltbr	Overall <sup>1/</sup> Mean & cwt/A	
	Kern	Tul		Ab	Kim					
A69870-3	10	21	15	22	38	64	20	11	29	153 ab
A72685-2	3	23	29	40	71	69	21	9	37	219 a
A74133-1	7	36	29	42	62	45	27	-	35	172 ab
A74212-1	5	20	15	39	51	54	29	15	30	194 a
A75188-3	11	37	17	52	71	53	35	14	39	224 a
NDD47-1	17	35	37	53	67	56	17	-	40	191 a
NDD277-2	18	27	21	27	41	51	18	-	29	117 bc
Lemhi Russet	7	27	13	45	52	55	23	13	32	164 ab
Russet Burbank	0	11	12	20	30	32	11	7	18	84 c
Location Mean	9	27	21	39	54	54	23		34	169

<sup>1/</sup> See Western Table 2 footnote 2/; California over 12 oz.

Western Table 5. Specific gravity of tubers.

Entry	California		Colo SLV	Idaho		Ore Herm	Wash Oth	Alberta Ltbr	Overall <sup>1/</sup> Mean
	Kern	Tul		Ab	Kim				
A69870-3	1.077	1.078	1.084	1.085	1.086	1.084	1.086	1.089	1.083 c
A72685-2	78	81	98	93	89	88	92	98	88 ab
A74133-1	84	81	86	82	83	83	86	--	84 c
A74212-1	81	82	89	83	83	77	85	87	83 c
A75188-3	72	78	93	82	76	80	87	83	81 c
NDD47-1	82	77	93	79	79	81	91	--	83 c
NDD277-2	72	82	96	84	79	82	95	--	84 c
Lemhi Russet	80	88	94	96	91	87	90	97	89 a
Russet Burbank	78	85	89	86	81	84	90	87	85 bc
Location mean	1.078	1.081	1.091	1.086	1.083	1.083	1.089		1.085

<sup>1/</sup> See Western Table 2 footnote 2/



Western Table 6. External and internal defects, french fry color, and sugars.

Entry	U.S. No.2 & Culls >4 oz	Common Scab (Ab)	Internal Necrosis %	Hollow heart %	Black- spot (ID)	Fry Color		Sugars % (ID)	
						OR 45°	ID 45°	Tot.	Red.
A69870-3	19 b	-	4	8 <sup>2/</sup>	3.3 <sup>1/</sup>	1.5	1.6 <sup>3/</sup>	0.8	0.3
A72685-2	22 b	3.1 <sup>1/</sup>	2	1	2.3	2.7	2.5	1.1	0.7
A74133-1	13 b	0.4	8	<1	1.7	4.0	3.5	2.5	1.5
A74212-1	29 b	2.0	4	0	2.9	3.4	3.2	2.0	1.3
A75188-3	63 a	0.2	2	0	1.4	3.9	3.2	2.2	1.3
NDD47-1	34 b	1.2	9	6	2.2	2.5	2.5	1.2	0.5
NDD277-2	26 b	2.4	1	4	2.0	3.7	1.7	1.3	0.4
Lemhi Russet	31 b	0.7	<1	4	4.7	1.6	1.5	1.1	0.2
Russet Burbank	76 a	0.7	11	13	2.5	1.8	1.9	1.2	0.5
LSD .05	23	1.0	-	4	0.6	-	0.6	0.3	0.2

<sup>1/</sup> Scab and Blackspot: 0-5, 0 (none) to 5 (maximum).<sup>2/</sup> Hollowheart: 6 locations summary; hollowheart in >10 or >12 oz.<sup>3/</sup> French fry color: USDA standard chart, 0.5 (lightest) to 4.0 (darkest).

Western Table 7. Tuber type and merit rating scores.<sup>2/</sup>

Entry	Tubers <sup>1/</sup> Shape Skin	California Kern Tul	Colo SLV	Idaho Ab Kim	Ore Herm	Wash Oth	Alberta Ltbr	Total Merit Score
A69870-3	0 Rus	2		1	4	3	1	11
A72685-2	0 Rus		4	3	5	5	4	24
A74133-1	0-L Rus	3	2	4		2		16
A74212-1	L Lt Rus	2	5	1	3		5	20
A75188-3	L-0 Rus					4	2	6
NDD47-1	0 White	5	3	2				15
NDD277-1	R White	4						9
Lemhi Russet	L-0 Rus	1		5	2		3	16
Russet Burbank	L Rus				2	1		3

<sup>1/</sup> Shape: 0 = oblong, L = long, R = round; Skin: Rus = russet, Lt = light.

<sup>2/</sup> Merit Rating: Rank Score

1	5
2	4
3	3
4	2
5	1

Potato Seedling  
and Cultivar  
Selection and  
Evaluation - 1983

In 1983, first-year single-hill, 5-hill, 12-hill, two replications of 20-hill, and four replications of 27-hill trials were conducted at two locations--Kern and Tulelake. In addition, replicated trials were conducted at a second Kern County location (in conjunction with the Western Regional Trials), in Riverside County and in the Santa Maria area. The Kern County and Tulelake data are summarized in Tables 1 and 2.

First-year seedlings (22,600) from Idaho (J. Pavék), North Dakota (R. Johansen), and Colorado (D. Holm) were grown. Of these 13,135 from 130 families were grown in Kern County, and 9,465 from 105 families at Tulelake. In Kern County, 198 were selected (65 russets, 95 whites or buffs, and 38 reds) from 90 families. This was a low 1.5 percent selection rate of seedlings and 69 percent selection rate of families. At Tulelake, 420 seedlings (326 russets, 94 whites or buffs, and no reds) from 98 families were selected. These represented above-average 4.4 percent and 93 percent selection rates of seedlings and families, respectively. Of the 130 families planted, 67 had selections made at both locations, 23 had selections at only Kern County, 31 had selections only at Tulelake, and 9 had no selections. The selection percentages of seedlings from Idaho were 0.9 percent and 4.2 percent in Kern County and Tulelake, respectively; from Idaho were 2.0 percent and 3.4 percent; and from Colorado were 3.5 percent and 3.6 percent. Parents with the greatest number of progeny selected were ND534-4, Lemhi, AD7267-1, WC230-24, A74444-3, and AD7377-1 of the russets; Crystal, NDD47-1, and AD7386-1 of the whites; and Redsen of the reds. Of the 130 families planted, approximately 100 had one or both parents that were either selected in California or had performed well in California and had specifically identified highly desirable traits. These included BC8370-4, Nooksack, Lemhi, WD641-10, AD74548-5, NDD47-1, NDD277-2, WC521-12, AD7267-1, Targhee, AD7386-1, TND14-1, AD7377-1, WC316-1, Centennial Russet, B7151-4 (Lenape), WC325-1, Atlantic, Redsen, Crystal, ND534-4, Norgold Russet, White Rose, NDD143-1, Norchip, and WC672-2. All had some progeny selected.

Second-year seedling entries from seven sources numbered 492 (168 in Kern County and 324 at Tulelake). Selection percentages were 14 percent and 31 percent, respectively. Seedlings originating from Idaho were selected at a 17 percent and 32 percent rates, respectively; and from North

Dakota 12 percent and 31 percent respectively. Of the 135 selections, 81 were russets, 46 were whites, and 8 were reds; 35 were selected at Kern, and 100 at Tulelake.

Third-year seedling entries from seven sources numbered 243 (129 in Kern County and 114 at Tulelake). Selection percentages were 34 percent and 19 percent, respectively. Seedlings originating from Idaho were selected at 29 percent and 25 percent, respectively, and from North Dakota 38 percent and 19 percent, respectively. Of the 66 selections, 36 were russets, 27 were whites, and 3 were reds; 44 were selected at Kern County and 22 at Tulelake.

In the advanced testing, 11 seedling lines were considered for release as named varieties by a joint committee of representatives from the University of California, potato industry, and California Department of Food and Agriculture. Although all were recommended for at least one more year of study before naming, three russets (AD7377-1, BC8370-4, and WC285-181), one long white (NDD47-1), and one round white chipper (NDD277-2) were considered top candidates. Three russets (AD7267-1, AD7267-3, and WD641-10), one long white (AD7386-1), and one white chipper (ND258-1) were considered good candidates. One russet chipper, WC672-2, was recommended to be dropped from further consideration.

AD7377-1 is an Idaho cross, California selection. Among its parents and grandparents are Targhee, Nooksack, and Norgold Russet. This heavy russet is a potential substitute for Centennial and Russet Burbank. It has performed well in all areas tested.

BC8370-4 is a Beltsville cross, Colorado selection. Parentage includes Targhee. It is chocolate brown, heavy russet, long blocky, very attractive. It is a potential substitute for Centennial. Potentially serious defects include susceptibility to scab and hollow heart. Yield potential is uncertain.

WC285-18 is a Washington cross, Colorado selection. This sibling of Centennial has Nooksack and Kennebec in its background. It is a very heavy chocolate-brown russet. Because of its tendency for coarseness, it is suitable to very light sandy soils. It is potential replacement for Centennial in these areas.

NDD47-1 is a North Dakota cross, California selection. This blocky white has Lenape and Campbell Soup selections in its background. Originally hoped to be a dual-purpose (chipping and fresh market) potato, chip quality has not been good. Its potential is as a substitute for White Rose.

NDD277-2 is a North Dakota cross, California selection. This round white has some common parentage with NDD47-1. It is smooth and has good chipping quality and good yield potential. It is a potential substitute for Kennebec.

In addition to these five, the committee reviewed the status of five other advanced lines. These are, with recommendations, as follows:

AD7267-3, a medium russet, should be tested at least one more year. Adaptability is probably restricted to Northern California.

AD7386-1. A long white with occasional tendency for severe banana shape. Must determine if that defect can be corrected.

ND258-1 is a round white chipper which has had inconsistent yield. More yield data is needed.

WC672-1 is a russet chipper with excellent processing quality, but is very susceptible to internal necrosis and sometimes seed-piece decay. It is recommended that it be dropped from the program.

PSWD641-10 is a golden medium russet with low yields due to long dormancy. More study is needed.



## 1983 POTATO VARIETY TRIALS

Kern Co. 1

Yield, cwt/A

Variety	Total	No. 1's		2's & Cull	B's	% No. 1's	Spec. Grav.	Tuber <sup>1</sup> Rating	Black <sup>2</sup> Spot	IN <sup>3</sup>	
		Total	>10 oz. 4-10 oz.								
A. RUSSETS											
A66122-3	415	385	45	340	15	15	93	82	3.3	0.5	0
NDD440-9	470	385	30	355	70	15	82	81	3.0	--	25
A69870-10	365	355	50	305	5	5	97	73	3.1	1.5	25
AD74135-1	390	355	5	350	5	20	91	80	3.2	--	0
NDD800-2	330	305	5	300	15	10	92	80	3.3	--	0
NDD666-2	335	295	15	280	10	30	88	77	3.1	1.8	0
A68599-1	340	295	0	295	20	25	87	83	3.1	1.5	0
NDD392-9	310	290	20	270	10	10	94	74	3.0	0.0	0
AND74344-1	305	285	5	280	5	15	93	79	3.0	0.7	0
Rus. Burbank	360	280	15	265	60	20	78	77	2.4	1.5	8
TND329-1	315	275	20	255	20	20	87	70	4.1	0.3	0
Centennial	290	270	40	230	5	15	93	76	3.3	0.8	0
AD7267-1	305	270	20	250	15	20	88	73	3.2	0.3	8
AD7430-2	295	265	5	260	5	25	90	78	3.3	2.1	0
NDD811-2	295	265	10	255	5	25	90	87	3.0	4.7	0
AND7430-1	290	260	5	255	10	20	90	90	3.3	2.5	0
A7596-1	290	255	20	235	20	15	88	78	3.1	3.0	0
Butte	310	255	5	250	30	25	82	80	2.5	2.2	0
A71996-4	275	250	10	240	10	15	91	101	3.1	0.6	0
Norgold Rus.	255	245	15	230	0	10	96	74	2.7	0.1	0
A72685-2	265	245	0	245	10	10	92	79	2.8	0.6	0
NDD840-1	285	245	25	220	15	25	64	75	2.9	0.3	0
WC285-18	255	240	15	225	5	10	94	80	3.2	0.6	0
A74265-2	260	240	5	235	20	15	88	82	2.9	1.1	8
A74133-1	275	235	10	225	10	30	85	79	2.6	0.5	0
Lemhi	255	225	0	225	5	25	88	85	2.9	2.7	25
AD77258-8	270	220	0	220	15	35	81	85	2.3	1.4	17
AD7377-1	240	210	10	200	15	15	88	75	3.2	0.4	0
BC9289-1	240	210	10	200	10	20	88	83	3.2	--	0
NDD1072-5	220	200	0	200	5	15	91	81	2.8	4.1	0
A74212-1	225	200	15	185	5	20	89	79	2.2	1.9	33
A76161-6	225	200	5	195	5	20	89	87	3.0	1.4	0
ND770-3	165	150	0	150	0	15	91	79	3.1	1.8	0
AD7267-3	160	135	0	135	0	25	84	78	2.9	2.4	0

## B. LONG WHITES

NDD47-1	335	315	40	275	10	10	97	83	3.9	--	8
UCR4-2	355	300	50	250	45	10	84	78	3.0	1.2	0
Wh. Rose	390	275	25	250	105	10	70	68	2.3	--	17
AD7386-1	315	265	25	240	30	20	84	72	3.3	--	0
AD74548-5	290	235	15	220	35	20	81	77	2.8	1.0	17

## Yield cwt/A

Variety	Total	No. 1's			2's & Cull	B's	% No. 1's	Spec. Grav.	Tuber <sup>1</sup> Rating	Black <sup>2</sup> Spot	IN <sup>3</sup>
		Total	>10 oz.	4-10 oz.							
C. CHIPPERS											
AD77526-4	445	410	50	360	20	15	92	82	4.0	--	8
UCR7-19	375	350	25	325	10	15	93	71	3.1	0.9	0
NDD277-2	360	345	40	305	10	5	96	80	3.2	0.4	0
ND89-9	360	340	10	330	10	10	94	74	3.1	0.0	33
UCR8-11	365	340	35	305	20	5	93	86	2.9	2.5	8
Crystal	385	335	15	320	30	20	87	73	3.4	0.0	33
Kennebec	340	320	55	265	10	10	94	82	3.7	0.2	0
WC672-2	320	305	30	275	5	10	95	90	3.1	2.0	33
ND258-1	335	305	5	300	5	25	91	81	3.0	0.5	0
AD77187-7	330	295	25	270	20	15	89	84	3.1	0.7	8
NDD828-7	310	285	10	275	5	20	92	85	3.0	--	0
ND777-1	290	280	5	275	5	5	96	81	2.7	--	0
AD77187-12	295	280	15	265	0	15	95	85	3.2	1.7	25
Atlantic	275	255	0	255	10	10	93	96	3.0	0.0	0
Belchip	255	235	5	230	10	10	92	90	2.9	0.3	33
NDD822-1	270	230	0	230	25	15	85	88	2.3	1.2	0
NDD929-8	225	210	0	210	5	10	93	81	2.5	--	0
D. REDS											
Chieftain	420	400	20	380	5	15	95	74	3.5	--	17
Red La Soda	365	340	40	300	15	10	93	77	2.8	0.9	25
Rhine Red	280	255	10	245	5	20	91	88	2.7	0.5	0
Sangre	255	235	0	235	5	15	92	71	3.6	0.5	0
AVERAGE	305	275	15	260	15	15	89	--	--	--	--
LSD.05	105	130	25	95	15	15	9	--	--	--	--

1) 1=Low, 5=High, 3=Minimum Acceptable Visual Rating

2) 0=None, 5=Very Severe

3) Percent of Large Tubers with Internal Necrosis



1983 POTATO VARIETY TRIALS  
Tulelake

Yield, cwt/A

Variety	Total	Total	# 1's		2's & Culls	B's	% No. 1's	Spec. Grav.	Tuber <sup>3</sup> Rating	Black <sup>2</sup> Spot	HH <sup>3</sup>
			>10 oz	4-10 oz							
A. RUSSETS											
A74212-1	675	640	150	490	15	15	95	82	4.1	2.0	0
A69870-3	530	485	110	375	15	30	92	78	3.9	2.2	16
Butte	560	485	85	400	15	60	87	79	3.0	2.4	0
AD74135-1	555	465	235	225	75	15	83	78	3.5	0	8
A66122-3	530	460	125	340	40	30	87	77	3.6	1.6	0
A75188-3	530	460	195	275	45	20	88	78	3.1	0.3	0
A74133-1	505	455	180	275	30	20	90	81	3.8	0	0
Lemhi	510	430	135	295	40	40	85	88	3.3	4.4	8
NDD840-1	475	395	90	305	25	55	84	79	3.8	1.7	0
Centennial	435	385	75	310	35	10	89	79	3.7	0.6	33
AD7267-3	450	385	85	305	20	45	86	82	3.5	1.3	0
AD7267-1	430	370	175	195	35	30	85	67	3.4	0.3	0
TND329-1	405	370	120	250	20	20	90	69	4.0	1.1	0
A7496-1	385	350	115	230	15	25	89	89	3.1	2.3	8
Rus. Burbank	495	350	55	295	65	80	71	85	3.6	0.8	17
A68599-1	375	340	50	295	10	20	91	75	3.3	0	0
AD7430-2	395	325	40	285	20	50	82	78	3.7	0.3	8
Nor. Russet	350	320	65	255	5	25	92	68	3.6	0	0
A72685-2	370	315	85	235	20	30	85	81	3.3	0.5	0
ND944-6	350	310	50	265	20	15	89	83	3.1	0	0
AND74344-1	360	310	35	275	25	25	84	82	3.3	1.4	42
ND534-4	350	305	30	280	10	30	88	71	3.8	1.1	0
AND7430-1	355	305	25	280	0	50	85	75	4.0	2.2	0
NDD392-2	365	300	100	195	40	25	81	74	3.9	0.1	0
AD7377-1	375	300	75	225	35	35	80	71	3.0	0.4	0
NDD811-2	345	290	20	270	5	50	85	72	4.1	1.9	0
A74265-2	345	285	90	195	40	20	83	81	3.2	0	0
A76161-6	365	280	65	220	30	50	77	87	3.6	1.5	0
NDD1072-5	290	265	50	210	5	20	90	80	2.8	1.7	0
NDD666-2	345	265	15	245	25	55	76	71	2.9	1.7	0
WC285-18	360	250	40	210	45	65	69	79	3.5	1.3	0
AD77258-8	350	245	60	305	50	50	80	80	3.8	3.2	0
BC9289-1	320	240	55	180	55	25	76	80	3.2	0.2	0
ND770-3	270	220	40	180	35	20	83	75	3.7	0	0
A71996-4	260	205	25	180	15	40	79	94	3.7	2.6	0
B. LONG WHITES											
NDD47-1	520	400	180	220	105	15	76	77	4.1	1.6	17
Wh. Rose	485	370	165	205	85	30	77	75	2.8	0.6	0
UCR4-2	495	355	70	285	75	60	72	77	3.3	0.8	25
AD74548-5	350	245	80	165	50	55	70	71	2.9	1.1	0
AD7386-1	335	240	85	160	70	25	72	73	2.5	0	0

## Yield, cwt/A

Variety	Total	Total	# 1's		2's & Culls	B's	% No. 1's	Spec. Grav.	Tuber <sup>3</sup> Rating	Bl ack <sup>2</sup> Spot	HH <sup>3</sup>
			>10 oz	4-10 oz							
C. CHIPPERS											
AD77187-12	635	580	65	515	10	45	92	93	3.7	2.7	0
WC672-2	570	555	95	460	5	10	97	87	3.9	0	50
AD77526-4	585	550	125	425	20	15	94	82	3.8	2.1	0
Atlantic	585	545	125	420	15	20	94	89	3.9	0.7	25
Belchip	520	500	105	395	10	10	96	90	3.9	0.2	8
ND258-1	550	500	140	365	35	10	91	74	4.0	1.5	0
Kennebec	600	485	235	250	100	15	81	80	2.8	0.4	8
Crystal	530	470	75	395	35	20	89	75	4.2	0.2	42
NDD277-2	480	455	130	325	15	10	95	82	4.3	0.2	0
NDD828-7	505	455	80	380	25	20	91	75	3.8	0.9	17
NDD822-1	410	350	25	325	30	25	86	82	3.3	0.3	0
UCR7-19	375	320	40	280	25	25	86	76	3.0	2.7	17
NDD929-8	335	290	60	230	15	25	87	73	3.3	0.5	0
ND777-1	315	275	30	245	20	20	87	69	3.5	1.0	50
UCR8-11	270	190	60	130	65	15	70	79	2.3	2.4	0
ND89-9	220	180	30	150	25	20	81	69	3.4	0	8
D. REDS											
Chieftan	545	525	155	365	10	15	96	75	4.2	0.4	33
Red La Soda	565	505	215	290	40	20	89	73	3.2	0.4	75
Sangre	285	255	40	215	5	25	91	76	3.5	0.3	8
Redsen	260	230	5	220	0	30	88	68	4.0	2.0	0

<sup>1</sup> 1=Low, 5=High, 3=Minimum acceptable visual rating

<sup>2</sup> 0=None, 5=Very severe

<sup>3</sup> Percent of large tubers with hollow heart

## COLORADO

D. G. Holm, M. Workman and M. K. Thornton

### Breeding Program

Characteristics being emphasized in the Colorado program are yield, specific gravity, russeting, and fresh market/processing qualities. Twenty-three parental clones were selected for crossing in 1983. Seeds from 142 combinations were obtained. Seventy seedling families were grown in the greenhouse producing 10,928 tubers for initial selection in 1984. Surplus tubers were distributed to Idaho, Oregon and Minnesota.

Seedling tubers were obtained from Dr. R. E. Webb, Beltsville, Maryland, Dr. J. J. Pavsek, Aberdeen, Idaho, and Dr. R. E. Voss, Davis, California. The California seedlings were produced from true seed obtained from Colorado.

### Selection Program

A total of 29,500 first-year seedlings were planted with 597 being selected for further observation. Another 441 clones were in various stages of preliminary testing. Eighty-four of these clones were selected for continued evaluation.

Advanced Yield Trial. Cultural and environmental data are summarized in Table 1 for the advanced yield trial. Data collected on the 17 advanced yield trial entries is presented in Table 2. Advanced russet selections showing promise and meriting further testing are: AC77149-2, AC77513-1, AC77514-1, AC77652-1, TC2-1, and WNC567-1. Selections TC2-1 and AC77652-1 will be entered in the 1984 Western Regional Trials.

Chipping Study. Eleven selections in various stages of development and two standard cultivars were tested for chipping potential at harvest and after various storage regimes. Results are presented in Table 3. None of the clones tested chipped satisfactorily directly out of 40° F storage or with reconditioning at 70° F for two weeks. Atlantic, Norchip and BR7093-24 produced acceptable chips for all other storage regimes. Other clones showing chipping potential include: TXA17-1, A70369-2, BC9955-1 and BC9956-2. Clones WNC521-12 and WNC672-2 did not perform well in this test. However, large scale tests indicate processing potential for these clones at harvest and after short storage periods. Selection WNC672-2 will be released to seed growers in 1984.

Potential Release. Selection WNC285-18, a sibling of Centennial Russet, has undergone extensive commercial testing and will probably be named within the next year.

Colorado Table 1. Advanced yield trial cultural and environmental data, San Luis Valley Research Center, Center, Colorado, 1983.

- CULTURAL DATA -

Soil Type	- Sandy Loam
Fertilizer	- Nitrogen and phosphorus banded at planting at 120 and 65 pounds per acre, respectively
Planting Date	- May 19
Vines Killed	- Diquat applied at the rate of 0.47 pounds active ingredient per acre on September 5; rotobeat September 13
Harvest Date	- September 16
Irrigation	- 10.1 inches applied by center pivot sprinkler
Weed Control	- Cultivated on June 8
	- Lasso applied at the rate of 2.5 pounds active ingredient per acre on June 10
Insecticides	- Monitor applied at the rate of 0.87 pounds active ingredient per acre on July 30.

- ENVIRONMENTAL DATA -

	MONTH				
	May	June	July	August	September
Rainfall (Inches)	0.85	1.71	0.50	1.29	0.53
Temperature ( <sup>0</sup> F)					
Average Maximum	61.8	70.5	80.3	79.7	75.0
Average Minimum	31.8	39.1	46.2	46.5	38.8

Colorado Table 2. Yield, grade, specific gravity, and maturity for advanced yield trial clones.

Clone	Total Yield		Yield		Yield		Specific Gravity	Vine Maturity <sup>1/</sup>
			U.S.No.1 Cwt/A	U.S. No.1 %	U.S.No.1 >10 oz. Cwt/A	Yield <4 oz. Cwt/A		
AC71861-4	400	262	65.5	31	65	72	1.082	3.5
AC71997-1	345	219	62.9	26	104	22	1.090	4.3
AC7426-3	283	178	63.2	9	97	8	1.087	1.5
AC77149-2	359	298	82.9	60	48	14	1.078	2.5
AC77513-1	404	323	80.0	59	52	29	1.097	3.8
AC77514-1	385	331	85.8	74	41	13	1.092	3.0
AC77652-1	316	254	80.1	52	45	18	1.080	2.3
BC9668-1	327	264	80.6	38	47	17	1.078	2.5
TC2-1	403	314	77.9	54	78	11	1.104	3.8
WNC567-1	367	282	76.5	32	64	21	1.085	2.3
WNC630-2	343	277	80.6	30	53	12	1.094	3.8
WNC708-6	319	264	82.4	41	32	24	1.089	2.5
Centennial Russet	358	289	80.8	72	58	11	1.089	3.0
Nooksack	311	261	83.9	82	18	31	1.104	4.8
Russette	396	307	77.5	29	72	16	1.097	3.0
Russet Burbank	366	221	60.6	23	104	41	1.089	2.5
Targhee	334	233	69.4	38	76	25	1.093	5.0
Mean	354	269	75.9	44	62	22	1.090	3.2
LSD (0.05)	36	46	7.1	26	17	17	-	0.7

<sup>1/</sup>Vine maturity is based on amount of dead foliage on August 31: 1 = Very Early; 2 = Early; 3 = Medium; 4 = Late; 5 = Very Late.

Colorado Table 3. Chip color<sup>1/</sup> and specific gravity of chipping study entries.

Clone	At	3 wks	10 wks	10 wks	2 wks/70°F		Specific Gravity
	Harvest	@ 70°F	@ 40°F	@ 50°F	10 wks/40°F	10 wks/50°F	
	Color						
A70369-2	1.0	1.5	4.5	3.0	3.5	2.0	1.097
BC9953-1	3.5	4.0	5.0	5.0	5.0	4.0	1.086
BC9955-1	2.5	1.5	5.0	3.0	4.5	1.5	1.100
BC9956-2	2.0	1.5	5.0	3.5	4.0	2.5	1.094
BC9988-4	3.0	4.0	5.0	4.5	5.0	3.0	1.094
BR7093-24	1.0	1.5	4.5	2.0	4.0	1.5	1.089
C07917-10	4.0	4.0	5.0	4.5	5.0	4.0	1.091
TXA17-1	1.5	1.5	4.5	2.5	3.5	1.5	1.081
TXC802-1	2.0	2.5	5.0	3.5	5.0	3.5	1.076
WNC521-12	3.5	2.5	5.0	4.0	4.5	3.0	1.090
WNC672-2	1.5	2.0	5.0	3.0	4.0	3.0	1.083
Atlantic	1.5	1.5	5.0	1.5	3.5	1.0	1.099
Norchip	1.5	1.0	5.0	1.5	3.5	2.0	1.084

<sup>1/</sup> Chip color was rated using the Potato Chip/Snack Food Association 1-5 scale.  
Ratings of 2 or less acceptable.



## FLORIDA

J. R. Shumaker, D. P. Weingartner, J. Watts, and R. E. Webb

### Variety and Seedling Trials

Methods. Potato varieties and seedlings were tested for their adaptability and desirable horticultural characteristics at the Agricultural Research Center, Hastings, Florida. Clones were grown in advanced trials (four replications). Telone<sup>®</sup> (6 gpa preplant) and Temik<sup>®</sup> (3 lb ai/A in-the-row at planting) were applied to all trials. Seed was spaced 12 inches apart in 20 foot single row plots. Between row spacing was 40 inches. The crop was planted February 4 and harvested May 23-25. Commercial cultural practices were used in all tests. Yield of tubers, their appearance and specific gravity were taken at harvest. Tuber samples were shipped to Berwick, Pennsylvania, for chip color evaluations. The tests were grown under wet, unfavorable conditions.

Round White Adaptability and Processing Quality Trials. USDA seedlings B8702-18, B9384-4, B9792-9 and B9792-45 produced tuber yields and demonstrated good processing traits which were equal to or better than those associated with Atlantic, standard chip processing cultivars (Table 1).

Long Russet Adaptability Trials: Reduced yields and tuber sizes were associated with all russet-skin clones (Table 2). Centennial Russet (standard russet-skin), Russette, Norgold 19-16, B9540-62, B9648-9 and B9720-3 produced some of the highest yields. They also produced acceptable uniform tuber types. Russette (an oblong to round tuber type) and B9540-62 (a long tuber type) will be grower evaluated in 1984.



Florida Table 1. Results from several clones selected for advanced testing at Hastings, Florida -- 1983.

Cultivar	Yield (cwt/A)		Tuber Appear- ance <sup>1/</sup>	Specific Gravity	Chip Color <sup>2/</sup> Weeks after harvest				Average
	US 1A	Total			1	2	3	4	
B9535-9	282	313	5.5	1.067	5	3	5	6	4.8
B8702-18	218	273	6.8	1.075	2	2	5	3	3.0
Sebago	217	272	7.0	1.066	2	3	5	5	3.8
B9792-16	194	251	5.5	1.066	5	5	4	5	4.8
Atlantic	192	237	6.8	1.078	4	6	6	6	5.5
B9792-9	175	207	6.5	1.077	1	2	3	2	2.0
B9792-45	169	230	7.0	1.079	3	3	2	3	2.8
B9384-4	158	205	6.5	1.071	2	1	2	1	1.5
B9786-20	157	214	5.5	1.074	3	3	5	4	3.8
Belchip	152	178	5.5	1.074	2	3	5	2	3.0
B9423-4	150	216	7.0	1.056	6	4	4	6	5.0
La Chipper	149	200	4.5	1.067	5	2	5	3	3.8
B9786-15	140	205	7.0	1.062	5	4	5	7	5.3
B8706-7	137	182	6.0	1.070	3	5	5	7	5.0
B9536-8	135	188	7.0	1.067	2	5	6	5	4.5
B9224-6	133	182	6.5	1.067	2	3	3	5	3.3
B7805-1	132	166	8.0	1.070	2	4	5	6	4.3
B9311-7	131	191	8.0	1.074	6	3	4	5	4.5
B9792-20	126	157	7.5	1.072	2	2	5	2	2.8
B9792-10	124	165	6.3	1.069	3	2	3	-	2.8
B9336-27	119	179	7.3	1.082	1	3	4	5	3.3
B9535-1	117	169	5.5	1.069	5	5	5	6	5.3
B9527-1	117	157	4.3	1.080	6	3	5	4	4.5
B9528-10	116	167	5.8	1.066	5	6	5	4	5.0
B9510-5	105	156	8.3	1.070	2	2	3	2	2.3
Oceania	101	149	8.0	1.059	3	5	5	6	4.8
B8706-14	99	150	7.5	1.076	2	6	3	5	4.0
B9792-2	96	141	6.5	1.078	2	5	5	6	4.5
B9140-32	93	154	6.5	1.076	1	2	1	2	1.5
Superior	87	121	7.5	1.067	5	5	5	6	5.3
Late Superior	86	139	7.3	1.069	6	6	6	5	5.8
B9514-38	86	134	8.3	1.070	1	2	3	1	1.8
Chipbelle	80	115	4.8	1.076	6	3	4	4	4.3
B9340-13	77	125	6.8	1.069	2	2	5	4	3.3
B9612-7	76	116	6.5	1.091	3	5	6	5	4.8
B9792-21	76	101	7.5	1.065	2	3	3	5	3.3
B7154-10	71	104	6.3	1.063	2	2	5	6	3.8
B9192-1	65	108	7.3	1.066	1	2	5	3	2.8
B8091-8	60	118	6.0	1.072	6	5	3	6	5.0
B9335-35	60	102	6.5	1.078	5	2	4	4	3.8
B8687-13	54	97	8.0	1.066	3	4	5	5	4.3
LSD (0.05)	62	62	1.2	0.006	-	-	-	-	-
(0.01)	81	83	1.6	0.008	-	-	-	-	-

1/ From 10.0 = most desirable to 0.0 = completely undesirable.

2/ Chip color: 1-4 = acceptable; 5 = borderline; 6-9 = too dark for use.

Florida Table 2. Results from several russet skin clones selected for advanced testings at Hastings, Florida -- 1983.

Cultivar	Yield (cwt/A) US 1A	Tuber Appear- ance <sup>1/</sup>	Specific Gravity
A63-71-1	192	5.0	1.066
B9648-9	166	7.8	1.060
Norgold 19-16	165	5.5	1.064
B9720-3	160	6.8	1.069
Russette	151	7.0	1.076
B9553-6	148	7.5	1.067
B9569-2	138	6.3	1.068
A71.72-1	133	6.3	1.066
A69.72-2	133	4.8	1.065
BelRus-4	129	6.8	1.071
BelRus-6	124	6.5	1.073
B9540-62	123	6.3	1.062
B9752-3	119	5.8	1.073
B9711-1	118	5.5	1.073
Centennial	117	7.0	1.062
Russet Burbank	102	3.3	1.071
B9539-14	101	6.8	1.065
BelRus	100	7.0	1.073
BN9797-2	95	5.0	1.071
B9752-7	93	8.3	1.060
A69-72-1	91	5.3	1.063
BelRus	90	6.8	1.070
BelRus-12	86	6.8	1.070
ND7003	84	5.8	1.061
B9724-16	69	4.3	1.062
B9738-5	68	5.5	1.065
B9399-1	66	5.8	1.064
B9523-10	57	5.0	1.060
B8972-1	56	6.5	1.063
B9596-2	53	7.3	1.063
B9398-2	30	2.8	1.069
GoldRus	23	6.5	1.063
LSD (0.05)	51	1.2	0.004
(0.01)	68	1.6	0.005

1/ From 10.0 = highly desirable to 0.0 = completely undesirable.

# ANNUAL POTATO BREEDING REPORT - IDAHO - 1983

J.J. Pavék and D.L. Corsini

## Yield Trials

Two hundred two selections (advanced, intermediate, preliminary) were grown in one or more of nine replicated yield trials at three locations. After harvest each entry was evaluated for internal quality. Advanced russet clones A7411-2 and A74114-4 and non-russet A76147-2 appear the most promising for yield and quality. These two russets are entered in the Western Regional Trial for 1984.

## Field and Storage Diseases

Verticillium wilt (vert) and scab resistance were tested in fields with natural inoculum; early blight through the use of susceptible spreader rows interplanted with test plots; leaf-roll net-necrosis in tubers from plots exposed to green peach aphid released on infected spreader plants; storage rots through inoculation of immature tubers at harvest with a combination of Fusarium sambucinum, F. coeruleum, and Erwinia atroseptica; blackspot by the discoloration which developed 24 hours after abrasive peeling. Named varieties were included for references. Results are summarized in Idaho Table 1. Most advanced late harvest selections have good resistance to verticillium, including some early maturing clones (A74114-4 and A76147-2). Early blight resistance was highly correlated with vert resistance but some early selections have more resistance to vert than to early blight. Several promising russeted clones (A7411-2, A72685-2) lack Russet Burbank's level of resistance to scab. Tuber blight was not severe this year and most advanced selections had Russet Burbank's level of resistance or better. Only A74114-4 appeared to be more susceptible. Net necrosis in tubers from the Kimberly leafroll plots was exceptionally severe this year. Several advanced or regional trial selections had worse net necrosis than Russet Burbank (A76147-2, A74212-1, NDD47-1), while 40% of the advanced clones were more resistant. Three advanced clones had outstanding resistance to combined storage rot pathogens (A76260-16, A7414-4, long russets and BR7093-24 a chipper). A74133-1 and A75188-3 had very good resistance to blackspot.

## Rootknot nematode

Screening for Columbia rootknot nematode resistance was continued in the greenhouse. Two S. sparsipilum accessions (PI365343 and PI246536) had little or no root galling in all seedlings tested.

## Virus Resistance

Fifty-six progeny of JB1-3 (gp andig) X A503-42 (gp tuberosum) continued to show complete resistance to mechanical transmission of PVY. Progeny of eight crosses with S. stoloniferum germplasm and a gp andigena cross were screened for the first time. Many of these should also combine PVS and PVX resistance.

## Germplasm Distribution

The distribution of potato germplasm from the Aberdeen program during 1983 is summarized in Idaho Table 2.

Idaho Table 1. Disease Evaluation Aberdeen 1983.

Clone	Field tests			Storage tests			
	Verticillium wilt 0-9	Early Blight 0-9	Common Scab 0-5	Tuber Early blight 0-5	Leafroll Net Necrosis 0-5	Storage rot Fusarium + Erwinia 0-5	Internal Blackspot 1-5
<u>Advanced</u>							
A72602-2	3.0*	5.3*	0.6	1.1	1.6*	4	4.3†
A7411-2	2.4*	5.2*	4.2†	1.2	2.1	3*	3.8
A74341-1	2.7*	5.7	0.3	1.1	2.3	4	4.7†
A76147-2	2.4*	4.9*	2.6†	1.3	3.3†	4	3.9
A76260-16	7.0	8.5†	1.4	0.7	2.6	2	4.4†
A77182-1	2.8*	6.4	0.9	0.7	1.1*	3*	4.1
TXA17-1	1.2*	3.9*	2.3†	1.2	1.6*	5	3.8
<u>Regional</u>							
A72685-2	4.2	6.4	3.1†	0.3*	2.2	4	3.7
A74212-1	2.5*	5.9	2.0†	1.4	3.2†	4	4.0
A74133-1	1.4*	3.3*	0.4	1.0	1.5*	5	2.1*
A75188-3	1.2*	3.2*	0.2	1.1	1.9	5	2.1*
NDD47-1	2.0*	4.7*	1.2	1.0	4.0†	3*	3.8
NDD277-2	1.3*	3.9*	2.4†	1.2	2.6	5	3.3
WNC285-18	3.2*	4.0*	3.3†	1.0	1.8*	4	3.5
<u>Advanced early</u>							
A71991-5	7.9†	8.7†	0.3	1.6	1.3*	4	3.0*
A74114-4	4.0	8.0	1.2	1.9†	2.8	2*	--
A75155-4	4.0	6.5	0.0	1.2	1.3*	4	2.7*
ND534-4 Rus	9.0†	9.0	1.5	0.7	1.8	3	--
NDA8694-3	9.0†	9.0	0.5	1.3	1.3*	4	2.6*
<u>Disease checks</u>							
A70369-2	3.5*	5.4*	3.0†	1.1	1.3*	4	--
BR7093-24	2.7*	6.2	4.8†	1.8†	1.6*	2*	--
AD7267-1	3.4*	5.5*	1.0	1.3	2.5	5	--
AD7377-1	1.7*	4.0*	0.1	1.1	1.6*	4	--
A503-42	2.2*	4.5*	3.2†	1.0	1.7*	5	--
A589-65	1.0*	2.9*	0.4	1.0	1.6*	5	--
A66107-51	1.0*	3.0*	0.2	1.4	2.0	5	--
A68113-4	1.7*	3.9*	4.8†	1.1	2.1	5	--
A6948-4	3.2*	6.0	3.8†	1.3	1.6*	5	--

Idaho Table 1. Disease Evaluation Aberdeen 1983 (contd.).

Clone	Field tests			Storage tests				Internal Blackspot 1-5
	Verticillium wilt 0-9	Early Blight 0-9	Common Scab 0-5	Tuber Early blight 0-5	Leafroll Net Necrosis 0-5	Storage rot Fusarium + Erwinia 0-5		
JB1-3	1.5*	3.7*	--	1.0	--	4	--	
A69868-2	5.8	7.9	2.2†	1.0	1.8	3*	--	
A75379-3	1.0*	3.4*	1.6	1.0	1.6*	3*	--	
WN245-2	5.5	8.2	2.3†	1.8†	1.1*	3*	--	
BR6316-7	1.0*	3.2*	2.8†	1.2	2.2	3*	--	
WNC630-2	3.2*	5.5*	2.0†	1.4	1.4*	3*	--	
A78105-6	2.2*	4.7*	0.2	0.7	1.5*	5	--	
Varieties								
Bel Rus	7.5	8.7†	3.2†	2.4†	1.1*	2*	--	
Butte	4.9	7.9	1.2	1.1	1.7*	4	--	
Desiree	1.9*	4.7*	4.4†	1.0	1.6*	3*	--	
Kennebec	4.9	5.9	3.1†	1.2	1.6*	5	--	
Katahdin	2.0*	5.4*	4.4†	1.1	1.4*	4	--	
Lemhi Russet	2.4*	6.0	0.7	1.1	2.3	3*	4.9†	
Nooksack	2.0*	5.2*	0.1	1.7†	2.4	5	3.2	
Norchip	5.0	8.0	0.4	1.1	1.7*	3*	3.4	
Norland	9.0†	9.0†	1.3	0.9	--	5	--	
Norgold	9.0†	9.0	0.6	0.3*	1.3	4	4.3†	
Russet Burbank	5.7	7.0	0.7	1.0	2.3	4	3.6	
R.B. (100% PVX)	5.2	7.4	1.2	1.0	2.4	4	--	
R.B. (giant hill)	1.7*	3.5*	0.6	1.0	2.7	5	--	
R.B. protoclone	3.2*	5.7	--	1.2	2.9†	4	--	
Targhee	2.9*	5.0*	0.2	0.7	2.7	5	--	
LSD @.05	2.2	1.5	1.0	0.7	0.6	1	0.6	

\* Significantly more resistant than Russet Burbank ( $P=0.05$ ).† Significantly more susceptible than Russet Burbank ( $P=0.05$ ).



Idaho Table 2. Distribution of clones, seedlings, and seeds - 1983.

LOCATION	COOPERATOR	NUMBER	LOCATION	COOPERATOR	NUMBER
<u>Clones:</u>					
Alberta	D. Lynch	1	New Mexico	J. Gregory	4
California	R. Voss	64	New York	B. Brodie	24
Colorado	D. Holm	1		D. Halseth	2
Georgia	C. Jaworski	18		R. Plaisted	3
Germany	J. Lange	4	North Dakota	R. Johansen	2
Idaho	G. Bishop	24	Oregon	M. Carmichael	2
	J. Davis	13		D. Hane	289
	R. Dwelle	1		C. Stanger	66
	T. Owings	8		J. Zalewski	1
	L. Pearson	1	Texas	D. Smallwood	21
	D. Peterson	9	Thailand	F. Bell	1
	J. Peterson	4	Washington	L. Hiller	1
Illinois	E. Leue	1		M. Martin	246
Kansas	J. Greig	2		N. Halsted	2
Maine	J. Reeves	3		W. Loescher	20
Manitoba	T. Gonsalves	1	Utah	G. Griffin	2
Maryland	R. Webb	2		J. Kikkert	1
Massachusetts	R. Reiprich	1	Wisconsin	J. Schoeneman	39
Michigan	R. Chase	64	Wyoming	K. Bohnenblust	1

Seedling tubers or seeds:

Alberta	D. Lynch	173 families
Argentina	H. Brücher	24 "
California	R. Voss	52 "
Colorado	D. Holm	74 "
Ecuador	H. Naranjo	55 crosses
Germany	J. Lange	10 families
North Dakota	R. Johansen	61 "
Oregon	S. James	74 "
	D. Hane	5 "
Texas	D. Smallwood	79 "

## LOUISIANA

James F. Fontenot, D. W. Newsom, H. M. Brewer, A. C. Miller, W. A. Poillion, and P. Wilson

### Introduction

The principal objectives of the Louisiana potato breeding project are wide adaptability, high yield, frost, heat and drought resistance, insect and disease resistance (particularly late blight and scab), improved culinary quality (including chipping quality, french frying quality, and baking quality), resistance to after-cooking darkening, improved storage ability, better shape and skin color and resistance to tuber greening. Development of an oblong russet type adapted to Louisiana conditions is highly desirable.

Other objectives are to gain a further insight into the physiological changes during rest and to ascertain the effect of growth regulators, applied as preplant, preharvest treatment on the production, storage ability and quality of potatoes. The total alkaloid content must be investigated. Air pollution may be a limiting factor in potato production and cultivar selection is essential to minimize yield losses.

Very few southern states have seen fit to include potato breeding as a research project for their state. Since none of these states, including Louisiana, produce certified seed potatoes it is of utmost importance that wide adaptability be our primary objective. We are unique in this respect because we realize unless a new clone will produce well in the areas of certified seed production (north) it will not be available for southern production no matter what its producing potential.

### Louisiana Trials

We were unable to prepare the soil properly due to excessive moisture in the months of January and February and this delayed planting until March 11, 1983. Flooding conditions continued which resulted in a very poor potato crop. However, some observations were made which are of interest to us.

In a replicated trial which included 22 cultivars it was noted that La Chipper, B9540-62, Indiana 78-59-1, Red Pontiac and North Dakota 534-4 Russet were significantly higher in yield. Under these Louisiana stress conditions only Red Norland was considered early in maturity. Norgold Russet and Minnesota 11533 were rated medium early. Cultivars which were considered medium in maturity were Louisiana 01-38, Louisiana 82-119, Norchip, North Dakota 534-4 Russet, North Dakota 372-2 R, La Chipper, Wisconsin 779, Minnesota 10874, Minnesota 10162, Nebraska A69.72-2 and Nebraska A131-4. Cones which were late in maturity were B9540-62, Russet Burbank, Red Pontiac, North Dakota 388-1



Russet, Wisconsin 842, Wisconsin 752, Indiana 78-59-1 and Nebraska A153-69-2. All of these lines were rated high in vigor except Norgold Russet, Red Norland, Wisconsin 779, Minnesota 10874, Minnesota 11533, Minnesota 10162, Nebraska A69.72-2 and Nebraska A131-4 which were medium in vigor. Tubers from all these entries were chipped and B9540-62 as well as Indiana 78-59-1 were rated best in chipping ability. High quality chips were made from Nebraska A131-4, Nebraska A153-69-2, Minnesota 10162, La Chipper, 01-38, Wisconsin 752, Wisconsin 842 and 82-119.

The three outstanding 1980 clones in yield were 01-5, 01-24 and 01-27 when grown under Louisiana weather conditions in the spring of 1983. Chips were made from all these lines and 01-24 and 01-18 were rated excellent in chipping ability.

In a replicated experiment composed of advanced clones it was determined that the outstanding cultivar was Red LaSoda under spring 1983 environmental conditions. It was observed that La Chipper and Haig were in the same class in chipping quality which was very good.

The outstanding 1981 clones were 12-9, 12-10, 12-20, 12-24, 12-33, 12-40, 11-50, 11-54, 12-56, 12-59, 11-82 and 13-99. The most promising line of this lot is 12-59.

Since yield at all Louisiana locations were poor except Calhoun, only this location will be submitted in tabular form (Table 1). Some quotes from A. C. Miller are included. "Two lines, 01-38 and 01-27, looked very good here. We had some brown heart or hollow heart again this year, but I did not cut enough tubers to determine differences. I did note that there was a considerable amount in 'Atlantic' again. Some of the area gardeners reported it in 'Kennebec' also." Top chipping clones in this experiment were 01-38, Kennebec and Atlantic.

We were very fortunate to make an outstanding potato crop at Stark Farms in Wisconsin which was harvested in the fall of 1983. Exactly 227 promising first year selections were made and approximately 90 percent possessed white skin color. Of the 115 first year selections made in Wisconsin in 1982 only lines 22-1, 22-10, 22-14, 22-16, 11-17, 21-20, 23-26, 21-30, 21-33, 21-53, 21-61, 21-64, 21-65, 21-70, 21-72, 21-74, 21-75, 21-76, 21-77, 21-79, 21-81, 21-84, 21-90, 21-92, 21-97, 21-99, 21-101, 21-109, 21-110 and 21-113 were considered worthy of further research after being grown in Louisiana in the spring and Wisconsin in the fall of 1983.

Other clones that were classed as being able to clear Louisiana and Wisconsin hurdles were 12-2, 12-9, 12-33, 12-35, 11-50, 11-56, 12-59, 01-24, 01-27, 01-33, 01-41, 01-47, 81,20, 31,124, 43-18, 42-38, 71-96 and of course 01-38 and 82-119 which were entered in the regional trial.

Louisiana Table 1. Irish Potato Variety Trial (1983) - Calhoun, La.

Variety	Yields (CWT. Per Acre)			Remarks
	T's	2's	Total	
Atlantic	339.7	30.5	370.2	Nice russet, some brown heart
Red LaSoda	322.3	74.9	397.2	Nice red, oval
01-38	315.3	38.3	353.6	Smooth white, oval to oblong
Kennebec	284.8	61.8	346.6	Oblong white
01-27	263.9	47.9	311.8	Nice white, oblong
Haig	244.8	64.4	309.2	White oval, slight russett
91-8	242.1	58.4	300.5	White, oval, some second growth
42-38	224.7	55.7	280.4	Nice red, oval
LaChipper	219.5	67.9	287.4	Nice white, oval
01-18	192.5	85.4	277.9	Small white, oval
01-55	192.5	41.8	234.3	Smooth white, oval
01-33	182.9	58.4	241.3	Smooth white, some pear shape
82-119	163.8	95.8	259.6	Smooth red, many small
LSD .05	59.7			

Fertilizer applied March 3 at the rate of 800 lbs. of 8-24-24 per acre, planted March 9, 15' plots replicated three times, topdressed April 19 with 200 lbs. of ammonium nitrate per acre and again May 4 with 400 lbs. of 13-13-13 per acre. Harvested June 21.

Hugh J. Murphy and Leigh S. Morrow

A cooperative variety trial was conducted at Presque Isle, Maine during 1983 consisting of 44 entries. Soil and weather conditions during May were cold and wet. Fair plant stands were obtained with the exception of Crystal and MN8224. By mid-June and during most of July, soil moisture levels were very low with much wilting of many varieties. Moisture levels increased somewhat by mid to late August which was too late to benefit early and medium early maturing varieties. Medium and later maturing varieties responded to the additional moisture, as shown by improved yields; but the rapid growth triggered growth cracks, hollow heart, and misshapen tubers.

Plots at Presque Isle were 25 feet long, single rows, and replicated six times per variety. Planting, killing, harvesting dates, seedpiece spacing, and fertilization rates for each maturity group are presented in Maine Table 3.

Yields, specific gravities, and percentage of yield in two grade size classes for all varieties grown at Presque Isle are presented in Maine Table 1. The five highest yielding varieties were: Red Pontiac, Rosa, NY64, NY59, and F73008. Seedling AF222-1 had the highest specific gravity followed by CF77154-10, Superior, BR7088-18, and CF7688-9. Because of the dry growing conditions, tubers tended to run toward the smaller sizes with very few oversized tubers. Most had some defects and quite a few varieties had hollow heart even in some of the smaller sized tubers.

Results of the first chipping and french fry color tests with tubers from 50° F storage are presented in Maine Table 2. Only nine of the 44 varieties had satisfactory chip color (7.0 or below) and 30 of the 44 varieties had satisfactory french fry color (3.0 or less).

Complete details of the Maine cooperative variety trials will be published in the 1983 Performance Evaluations of Potato Clones and Varieties in the Northeastern States. This will be available as bulletin #801 from the Public Information and Central Services (PICS), University of Maine; Orono, Maine 04469.

Maine Table 1. Yield by hundredweight per acre, percentage of yield between 1-7/8 and 4 inches in diameter, and specific gravity for varieties grown at Presque Isle, Maine - 1983.

Variety	Yield Cwt./A.	Percentage of yield 1-7/8 to 4 inches	Percentage of yield 2-1/2 to 4 inches	Specific gravity
Alaska Russet	286	51.0% 4 - 10 ounces		1.079
Crystal	332	87.6	44.8	1.078
Hampton	375	89.7	61.5	1.075
Katahdin	381	87.0	62.6	1.078
Kennebec	331	87.8	57.7	1.074
Kennebec	369	86.1	59.8	1.078
Michibonne	357	84.8	62.9	1.076
Michimac	338	93.0	52.6	1.076
Nobless Russet	299	50.1% 4 - 10 ounces		1.082
Red Pontiac	412	78.5	57.3	1.069
Redsen	250	90.4	19.5	1.076
Rhine Red	298	88.6	50.8	1.069
Rosa	405	76.4	39.1	1.081
Russet Burbank	305	58.3% 4 - 10 ounces		1.083
Superior	280	87.8	29.7	1.088
AF201-25	307	87.7	37.2	1.079
AF222-1	242	85.4	18.6	1.092
AF236-1	310	84.6	49.7	1.080
AF303-5	359	89.5	47.6	1.082
AF307-5	283	92.1	39.9	1.073
AF330-1	259	86.8	49.9	1.084
AF332-9	327	89.2	57.7	1.073
AS201-10	271	85.4	22.5	1.077
B5662-WV13	193	90.7	31.0	1.074
B6928-WV14	316	87.6	45.9	1.074
B6949-WV3	353	83.9	57.9	1.078
B7019-WV1	295	88.2	44.0	1.067
BR7088-18	337	84.5	48.8	1.088
BR7093-23	366	84.9	44.1	1.081
C74109-8	323	79.2	36.9	1.074
CF72107-15	311	87.5	49.8	1.079
CF72111-5	320	87.1	32.7	1.077
CF7353-1	351	79.7	52.8	1.077
CF74135-3	270	80.9	21.9	1.070
CF7523-1	320	90.2	23.7	1.079
CF7587-7	282	81.2	21.4	1.084
CF7688-9	313	90.6	56.8	1.087
CF76183-2	264	64.6	8.9	1.083
CF77154-10	297	89.3	37.4	1.090

. . . continued

Maine Table 1 - continued

Variety	Yield Cwt./A.	Percentage of yield 1-7/8 to 4 inches	Percentage of yield 2-1/2 to 4 inches	Specific gravity
F73008	383	81.4	42.6	1.080
MN7973	292	89.5	48.9	1.070
MN8224	220	90.2	37.9	1.086
MN9319	270	60.3% 4 - 10 ounces		1.080
NY59	384	85.3	56.3	1.077
NY64	391	75.7	36.1	1.075
Waller Duncan L.S.D. (0.05)	32			0.002

Maine Table 2. Chip color and french fry color and texture indices for potato varieties grown at Presque Isle, Maine - 1983.

Variety	Chip Color <sup>1</sup>	French Fry	
		Color <sup>2</sup>	Texture <sup>3</sup>
Alaska Russet	8.4	3.2	1.5
Crystal	8.2	2.2	1.7
Hampton	9.0	3.3	1.0
Katahdin	8.9	2.5	1.0
Kennebec	8.9	2.6	1.1
Michibonne	8.9	3.0	1.1
Michimac	9.0	2.9	1.1
Nobless Russet	8.4	3.3	1.4
Redsen	6.8	1.1	1.1
Red Pontiac	10.0	4.3	1.0
Rhine Red	9.7	3.6	1.2
Rosa	6.4	1.1	1.1
Russet Burbank	8.8	3.2	1.2
Superior	6.2	1.2	1.1
AF201-25	8.5	2.8	2.3
AF222-1	7.1	1.4	1.0
AF236-1	4.6	1.0	1.4
AF303-5	8.3	2.7	1.9
AF307-5	8.6	2.4	1.0
AF330-1	4.2	1.1	1.0
AF332-9	9.6	3.2	1.2
AS201-10	7.2	1.6	1.0
B5662-WV13	7.4	1.4	1.1
B6928-WV14	10.0	3.4	1.3
B6949-WV3	8.9	2.8	1.1
B7019-WV1	8.1	1.9	1.2
BR7088-18	6.2	1.2	1.0
BR7093-23	6.5	1.1	1.4
C74109-8	8.6	2.2	1.0
CF72107-15	7.9	2.2	1.4
CF72111-5	9.9	3.4	1.1
CF7353-1	6.8	1.1	1.2
CF74135-3	7.4	1.8	1.1
CF7523-1	8.5	2.4	1.0
CF7587-7	8.0	2.4	1.1
CF7688-9	7.9	1.9	1.0
CF76183-2	5.2	1.0	1.1
CF77154-10	4.8	1.0	1.0

. . . continued

Maine Table 2 - continued

Variety	Chip Color <sup>1</sup>	French Fry	
		Color <sup>2</sup>	Texture <sup>3</sup>
F73008	8.4	2.3	1.4
MN7973	8.0	1.4	1.9
MN8224	6.5	1.0	1.0
MN9319	6.9	1.8	2.1
NY59	10.0	4.1	1.2
NY64	9.9	4.0	1.0
Waller Duncan L.S.D.			
(0.05)	0.5	0.4	0.3

<sup>1</sup>/Chips with lower index numbers are lighter in color.

<sup>2</sup>/French fries with lower indices are lighter in color.

<sup>3</sup>/Lower texture indices indicate a mealier texture.



Maine Table 3. Pertinent Information About the Maine Cooperative Potato Variety Trials.  
Presque Isle, Maine - 1983.

Maturity Season	Date Planted	Date Killed	Date Harvested	Fertilization	Seedpiece Spacing
Early & Med. Early Varieties	May 23	August 30	September 13	130-130-130	<u>1</u> / <sub>2</sub>
Medium Varieties	May 23	September 6	September 15	130-130-130	<u>1</u> / <sub>2</sub>
Medium Late Varieties	May 23	September 14	September 23	130-130-130	<u>1</u> / <sub>2</sub>
Late Varieties	May 23	September 20	September 29	130-130-130	<u>1</u> / <sub>2</sub>
Russet & Long Type Varieties	May 23	September 26	October 7	130-130-130	<u>2</u> / <sub>2</sub>

1/<sub>2</sub> Seedpieces of all varieties spaced 8 inches apart.

2/<sub>2</sub> Seedpieces of Alaska Russet spaced 9 inches apart.  
Seedpieces of Nobless Russet spaced 10 inches apart.  
Seedpieces of Russet Burbank and MN9319 spaced 16 inches apart.

Alvin F. Reeves, Robert B. Long, and Garland Grounds

Potato Breeding

Seed and seedling production. The crossing scheme this year included parents which were resistant to four major diseases: leafroll, common scab, acid scab, and verticillium. A total of 104 parents were involved in 64 different crosses, producing 76,050 seeds. Open-pollinated fruits of 12-hill plots yielded 488,300 seeds. Greenhouse plantings of true seeds produced 24,662 tubers for the 1984 field planting, and an additional 20,499 tubers for disease resistance screening.

Planting methods. Field plots were handled as they have been for the last few years. Planting was accomplished during the period between May 18 and June 6. Killing was done between August 9 and September 9. Plots were dug generally two to three weeks after killing.

Seedling selection. A total of 237 (2.4% ) selections were saved from 9,891 single hills. From the 370 12-hill plots, 100 (27%) were saved for further testing. Fifty-four 60-hill plots, 101 advanced selections, and 129 Campbell selections were maintained and tested.

Cell cloning. Nineteen selections were retained for further testing. An additional 80 selections were increased for selection in 1984.

Disease tests. In cooperation with Drs. Frank Manzer, Richard Storch, Bill Brodie, Raymon Webb, Robert Goth, Gilbert Banville, and Robert Young, a number of selections were tested for resistance to the following diseases: resistance to early blight was found in five of 39 selections tested, to late blight in 10 of 60, to acid scab in nine of 62, to common scab in 31 of 70, to leafroll in seven of 54, to Verticillium in seven of 41, to golden nematode in 12 of 63, to blackspot in 56 of 168, to shatter bruising in 24 of 168, to hollow heart in 21 of 98, to net necrosis in 100 of 111, to greening in 67 of 119, and to virus X in 17 of 118.

Yield tests. A total of 185 selections were tested in replicated yield tests in 1983. Forty-nine yielded as well as the controls; 57 had higher specific gravities; and ten equaled the controls for both characteristics.

Chip tests. In chipping test number one, four named varieties and 36 advanced selections were chipped from storages held at 45° F ( 7° C ) and 38° F ( 3° C ). The 38° material was reconditioned for three weeks at 70° F ( 21° C ). All samples were processed in February. Results are in Table 1.

Chip test number 2 included 14 advanced selections and five named varieties. Samples were processed in December, February, and April after storage at 55° F ( 13° C ), 50° F ( 10° C ), 45° F ( 7° C ), and 38° F ( 3° C ). The 38° material was reconditioned for three weeks at 70° F ( 21° C ) before cooking. Results of the December and February cooking are shown in Table 2.

Grower trials of advanced selections. Six selections were grown on commercial farms in 1983. BR 7093-23: Seven growers planted this round white, late-maturing selection. Generally good size and appearance were noted. This will be named Campbell 14. CF 7358-14: This early, golden nematode resistant round white was tested by ten growers. Good appearance was the common comment. This compares well to Superior, but with slightly lower yields. It will be named Sunrise.

CF 7523-1: Seven growers reported on tests of this round white main-crop variety. Long Island growers had poor stands, but Maine growers had high yields and good appearance. The largest quantity was lost to Fusarium breakdown in storage. The other two storages have had no problems Through February. Further tests will be conducted in 1984.

WF 564-3: This oblong russet selection was grown by three farmers. It gives high yields with many growth cracks. Its low dry matter suits it for multipurpose tablestock, rather than for processing or count box bakers. A shortage of seed will delay naming for one or two years.

AF 92-3: A medium-late round white grown only by one seed grower in 1983. Further tests are planed for 1984. This is resistant to blight, scab, and virus X.

CF 7353-1: A purple-skinned selection grown by one tablestock grower. Good yields and high dry matter along with good chip color may make this selection useful for chipping and special uses tablestock. One serious problem which was apparent in 1983 and 1982 was shatter cracking.

Maine Table 1. Potato Chip Test #1, Aroostook Farm, Presque Isle, Maine 1983<sup>1/</sup>.

Pedigree	Storage Temperature (° F)		Average
	45	38 <sup>2/</sup>	
AF 262-7	6.3	4.3	5.3
AF 500-13	6.1	8.7	7.4
AF 508-2	7.5	7.6	7.5
BR 7093-23	6.2	7.3	6.7
CF78103-1	7.6	7.8	7.7
CF79167-2	7.3	7.6	7.4
CF 8003-2	7.3	7.8	7.5
CF 8005-6	8.5	8.3	8.4
-12	7.2	7.8	7.5
-13	5.4	5.6	5.5
CF 8012-1	8.0	7.8	7.9
CF 8016-5	8.5	8.9	8.7
CF 8018-11	8.2	7.4	7.8
CF 8019-1	7.1	6.7	6.9
CF 8054-2	8.1	7.7	7.9
-4	7.4	5.8	6.6
CF 8060-1	7.4	7.7	7.5
CF 8091-1	5.6	6.3	5.9
CF80185-1	6.5	6.8	6.6
CF80220-2	7.3	5.3	6.3
CS 7232-4	4.9	4.5	4.7
CS 7533-13	6.5	8.0	7.2
-25	8.8	8.8	8.8
CS 7638-6	8.8	8.2	8.5
CS76111-12	8.5	7.9	8.2
-14	7.1	6.6	6.8
CS77120-1R	6.0	6.3	6.1
CS77127-36	8.7	7.2	7.9
CS77138-32R	6.9	6.0	6.4
CS 7910-18	8.2	7.5	7.8
CS 7919-11	8.2	7.1	7.6
CS 7920-3	8.7	9.5	9.1
-18	6.7	5.9	6.3
CS 7952-1	7.6	8.1	7.8
-16	7.0	6.7	6.8
CS79147-1	6.3	7.4	6.8
Allagash Russet	4.5	5.1	4.8
Kennebec	7.7	8.0	7.8
Monona	5.5	5.7	5.6
Norchip	5.8	6.2	6.0

<sup>1/</sup> All samples cooked in February. Chip color ratings from National Potato Chip Institute Chart 1206-U, where 1 = very light and 10 = very dark. Each value an average of four replications of five chips each.

<sup>2/</sup> Tubers reconditioned three weeks at 70° F (21° C).

Maine Table 2. P to Chip Test #2, Aroostook Farm, Presque Isle, Maine, 1983<sup>1/</sup>

Pedigree	Storage temperature (° F)										Average
	December					February					
	55	50	45	38 <sup>2/</sup>	55	50	45	38 <sup>2/</sup>			
AF 236-1	3.8	3.5	4.0	5.9	3.7	3.5	4.5	5.5			4.3
AF 324-1	4.0	3.3	3.9	4.0	3.4	3.7	3.5	4.4			3.8
AF 330-1	3.9	3.5	3.7	4.5	3.5	3.3	4.3	4.6			3.9
AF 544-5	4.3	3.6	4.1	4.8	4.0	3.8	4.8	6.9			4.5
-7	3.5	3.0	3.5	4.1	3.6	3.4	4.4	4.3			3.7
AF 564-2	7.4	6.6	7.8	8.5	5.6	6.7	7.7	7.1			7.2
BR 7088-18	5.9	4.5	6.1	6.3	5.1	6.0	8.4	8.4			6.3
CF76183-2	4.2	4.3	5.6	5.5	3.7	4.3	6.0	6.6			5.0
CF77154-10	3.6	4.0	4.7	4.9	3.7	3.2	4.9	5.7			4.3
CF 8016-2	5.1	3.9	5.6	5.2	3.9	4.1	7.1	6.7			5.2
-6	4.8	4.3	4.7	5.1	3.9	4.0	5.2	5.8			4.7
CF80202-1	4.3	3.8	4.8	4.8	3.5	3.8	4.9	5.4			4.4
CF80247-1	5.7	5.5	7.6	7.0	4.0	5.4	8.0	5.7			6.1
CS 7232-4	3.4	3.0	3.3	4.1	3.5	3.2	5.0	4.9			3.8
Allagash Russet	4.7	4.3	4.5	4.9	4.0	3.9	5.4	5.5			4.7
Chipbelle	4.5	4.4	6.9	4.8	3.4	4.0	7.5	5.6			5.1
Kennebec	6.1	5.4	7.6	7.6	4.3	5.3	7.5	7.6			6.4
Monona	3.5	3.7	5.0	5.0	3.5	3.5	5.7	5.3			4.4
Norchip	3.6	3.8	4.0	4.7	3.4	3.8	5.5	5.6			4.3

1/-2/ See Maine Table 1.



## MICHIGAN

R.W. Chase, R.B. Kitchen, R. Vander Zaag, R. Leep, and  
R. Hammerschmidt

### Dates of Harvest

The 1983 dates-of-harvest study was conducted at the Montcalm Research Farm. Three complete plantings and four replications of all varieties were made on May 4 in individual plots 10 feet x 34 inches. Plant spacing within the row was 12 inches.

The previous crop was alfalfa and 250 lbs/A of 0-0-60 were plowed down, 500 lbs/A of 20-10-10 were applied with the planter, and two sidedress applications of 46-0-0 at 150 lbs/A each were applied in June prior to hilling. Aldicarb (Temik 15G) was applied at 20 lbs/A at planting. Alachlor (Lasso) was applied at early preemergence at 2 lbs/A and metribuzin (Lexone) at  $\frac{1}{2}$  lb/A at delayed preemergence. The plots were irrigated 17 times and foliar insecticides and fungicides were applied as needed.

The weather stress was very severe in 1983 with cool and wet soil conditions at planting followed by slow emergence and early growth. This was followed by extremely hot and dry weather throughout most of the growing season. Total rainfall April through September was 19.11 inches which is very comparable to the 15 year average, however, rainfall during June, July, and August was only 5.84 inches or about 50 percent of normal. Average maximum temperatures were substantially above normal during this same period. There were 14 days with temperatures about 90° F and there were many nights that temperatures did not drop below 70° F.

### Results

Table 1 summarizes the yields, size distribution, and specific gravity of the several cultivars at each harvest. Average yields on August 9 were well below the normal average with only 74 percent U.S. No. 1 size. The severe weather caused below normal performance of several varieties. Individual varieties such as Shepody, Ontario, and Russet Burbank were substantially below 60 cwt/A of marketable potatoes. Average total yields increased by 71 percent by August 31 harvest and the yield of U.S. No. 1 (marketable size) increased by 95 percent which reflects the fact that tuber sizing for many varieties was delayed. Even at the late harvest several varieties still had a high percentage of tubers under two inches.

Table 2 summarizes the internal defects, chip ratings, and black spot damage. Vascular discolorations were fairly prevalent, however, these were predominately classed as slight and would not cause any market problem. Those noted as severe would clearly show in a processed potato chip, however. Internal necrosis was minimal and hollow heart was not as severe as anticipated. Chip scores except for Onaway and Ontario were all rated as very good.



Michigan Table 1. Yield, size distribution, and specific gravity of several potato varieties harvested on three different dates in 1983.

Variety	August 9 (97 Days)					August 31 (119 Days)					September 23 (142 Days)										
	Yield cwt/A	No.	Percent Size Distribution			Pick Outs	SG <sup>1/</sup>	Yield cwt/A	No.	Percent Size Distribution			Pick Outs	SG <sup>1/</sup>	Yield cwt/A	No.	Percent Size Distribution			Pick Outs	SG <sup>1/</sup>
			<2"	2-3¼	>3¼					<2"	2-3¼	>3¼					<2"	2-3¼	>3¼		
Total	1						Total	1						Total	1						
Snowchip	247	168	30	66	2	2	1.067	420	349	15	75	8	2	1.074	584	484	15	71	13	2	1.071
MS-702-91	262	167	34	64	0	2	1.075	462	409	12	85	4	0	1.078	534	475	10	78	11	1	1.076
Onaway	410	370	9	76	14	1	1.067	578	515	7	69	20	4	1.066	532	505	5	76	20	0	1.065
MS-700-83	272	204	23	71	4	2	1.078	467	412	11	73	15	1	1.080	501	450	10	70	20	0	1.078
MS-704-17	281	243	13	74	12	1	1.077	522	508	2	59	38	0	1.077	494	469	5	60	35	0	1.073
Shepody	106	56	47	53	0	0	1.075	377	202	16	49	5	30	1.077	492	321	11	44	21	24	1.080
Ontario	45	8	82	18	0	0	1.063	189	77	37	41	0	23	1.061	475	302	17	61	3	19	1.070
Atlantic	264	199	24	75	0	1	1.088	418	373	11	85	5	0	1.089	432	375	13	82	5	0	1.090
Katahdin	183	133	27	73	0	0	1.064	406	366	10	72	18	0	1.069	419	380	9	72	19	0	1.067
R. Burbank	137	52	58	38	0	4	1.072	422	187	31	43	1	25	1.077	417	171	30	40	1	29	1.075
MS-716-15	233	158	32	66	2	0	1.090	379	325	14	72	14	0	1.089	407	357	12	78	10	0	1.087
MS-718-6	143	106	26	74	0	0	1.075	341	308	10	77	13	0	1.078	396	369	6	63	31	1	1.078
MS-704-10	302	205	32	67	1	1	1.085	425	381	11	80	10	0	1.085	392	340	13	81	5	0	1.083
MS-714-10	191	114	40	60	0	0	1.077	410	341	17	77	6	0	1.078	388	313	18	70	11	2	1.073
Chipbelle	210	143	30	68	0	2	1.084	362	306	13	72	13	3	1.094	373	304	17	82	0	2	1.093
MS-702-80	233	150	35	64	0	1	1.074	370	319	14	80	6	0	1.075	371	317	15	80	5	0	1.074
Yukon Gold	254	199	20	73	6	2	1.078	391	349	11	75	14	0	1.079	346	303	12	75	13	0	1.076
B-7154-10	276	218	20	75	4	1	1.062	404	349	11	76	10	3	1.062	342	273	14	74	6	6	1.058
C-13	237	203	13	82	3	2	1.077	354	326	6	79	13	2	1.075	331	286	11	78	9	2	1.070
MS-700-79	202	171	14	83	2	1	1.084	345	322	7	78	15	0	1.085	313	282	10	73	17	0	1.082
Jemseg	318	289	9	79	12	0	1.075	337	321	4	74	22	0	1.070	302	279	7	82	10	1	1.066
B-7805-1	206	172	16	82	2	1	1.068	304	274	9	81	10	1	1.069	296	258	10	68	20	3	1.068
MS-701-22	185	143	23	75	2	0	1.078	291	260	10	78	11	1	1.082	282	252	11	80	10	0	1.079
B-9540-62	216	143	34	64	2	0	1.071	297	230	23	66	12	0	1.072	248	181	27	68	5	0	1.069
AVERAGE	226	167					1.075	386	325					1.077	403	335					1.075

1/ SG = Specific Gravity.

Michigan Table 2. Internal defects<sup>1/</sup>, chip scores, and bruising damage of several potato varieties in 1983.

Variety	August 31 Harvest						September 23 Harvest					
	VAS DIS	INT NEC	H	H	Chip <sup>2/</sup> Score	% <sup>3/</sup> Bruise Free	VAS DIS	INT NEC	H	H	Chip <sup>2/</sup> Score	% <sup>3/</sup> Bruise Free
Atlantic	3 s1	0	0		1.0	94	3 s1	0	0		1.0	90
Chipbelle	2 s1	0	0		1.0	66	6 s1	0	0		1.0	95
							2 sev					
Jemseg	2 s1	0	0		1.5	86	4 s1	0	0		2.0	89
Katahdin	5 s1	0	1		1.5	66	7 s1	0	0		1.5	87
							3 sev					
Onaway	3 s1	0	0		3.0	87	5 s1	0	0		3.5	95
Ontario	3 s1	0	0		3.0	-	0	0	0		3.0	-
R. Burbank	0	0	1		2.0	72	5 s1	0	4		2.0	88
Shepody	4 s1	0	1		2.0	100	3 s1	0	0		2.0	92
Snowchip	3 s1	0	0		1.5	81	7 s1	1	0		1.5	96
	1 sev						4 sev					
Yukon Gold	3 s1	0	0		1.5	82	8 s1	0	0		2.0	93
MS700-79	0	0	0		1.0	60	0	0	0		1.0	83
MS700-83	0	0	0		1.0	74	2 s1	0	0		1.5	86
MS701-22	0	0	0		1.0	43	0	0	0		1.5	86
MS702-80	0	0	0		1.0	88	0	0	0		1.0	93
MS702-91	7 s1	0	1		1.0	87	0	2	0		1.5	85
MS704-10	0	0	0		1.0	76	1 s1	0	0		1.5	84
MS704-17	2 s1	0	0		1.5	67	3 s1	0	0		1.5	80
MS714-10	1 s1	0	0		1.5	67	0	0	2		2.0	95
MS716-15	1 s1	0	0		1.0	76	4 s1	0	0		1.0	92
MS718-6	1 s1	0	3		1.0	50	8 s1	0	2		1.5	89
B7154-10	5 s1	0	0		1.0	-	-	-	-		-	-
B7805-1	1 s1	0	1		1.5	-	-	-	-		-	-
B9540-62	5 s1	0	0		1.5	90	10 s1	0	0		1.0	80
C-13	3 s1	0	0		1.0	80	7 s1	0	1		1.5	-

<sup>1/</sup> 20 tubers cut to determine internal defects.  
VAS DIS = vacular discoloration; INT NEC = internal necrosis;  
H H = hollow heart.  
s1 = slight, sev = severe.

<sup>2/</sup> Chip score based on PC/SFA 1-5 scale. 1 = lightest, 5 = dark, not acceptable.

<sup>3/</sup> Bruising evaluation run by Ore-Ida; damage noted primarily as black spot which is determined after peeling.

Table 3 summarizes the after-cooking-darkening ratings which were determined on December 7 after storage at 52° F. Varieties which showed the greatest degree of darkening were Ontario and Snowchip. Several selections showed increased darkening as the tubers were allowed to cool which is not desirable from a consumers standpoint.

Michigan Table 3. Determinations of after-cooking-darkening of several potato cultivars.

	After Cooking Darkening <sup>1/</sup>	
	0 Hours	2 Hours
Atlantic	1.0	1.0
Chipbelle	2.0	2.0
Jemseg	1.5	2.5
Katahdin	1.5	2.5
Onaway	1.5	2.0
Ontario	1.5	3.5
Russet Burbank	1.0	1.0
Shepody	1.0	1.0
Snowchip	1.5	3.5
Yukon Gold	1.0	1.0
MS700-79	1.5	2.0
MS700-83	1.0	1.5
MS701-22	1.0	1.5
MS702-80	1.0	1.0
MS702-91	1.0	1.5
MS704-10	1.0	1.5
MS704-17	1.0	1.5
MS714-10	1.0	1.0
MS716-15	1.0	1.0
MS718-6	1.5	2.5
B9540-62	1.0	2.5
C-13	1.0	1.0

<sup>1/</sup> Samples stored 75 days at 52° F. Tubers peeled and sliced in half from stem end to apical end. Samples steam boiled for 35 minutes. Readings made at completion of boiling and at two hours after tubers were cooled. 1 = light with no darkening; 5 = overall gray to black darkening.

Variety  
Observations

Atlantic - Yielded above average at all harvest dates with high specific gravity, excellent chip quality, and no after cooking darkening was observed. Tubers do slough after boiling because of high dry matter.

Chipbelle - Yielded below the average at each harvest and highest in specific gravity.

Jemseg - An early maturing variety that sets and sizes tubers early. Second highest yielder at 97 day harvest but still substantially below Onaway. Variety tends to have a light set which contributes to larger sizing. Specific gravity and chip quality is better than Onaway. Foliage showed severe wilt-type early dying.

Katahdin - A late maturing variety which sized tubers well by the third harvest.

Onaway - The highest yield at both the first and second harvests and no internal defects.

Ontario - Very late maturity as evidenced by the poor sizing. High percentage of pick outs due to second growth and heat sprout. Considerable after cooking darkening.

Russet Burbank - Very poor sizing and high percentage of pick outs. Hollow heart noted at both the second and third harvests.

Shepody - Late maturing and a high percent of pick outs, mostly off-type and growth crack. Some scab noted. A long, white with higher specific gravity than Russet Burbank. Processes well for frozen french fries. May be susceptible to mosaic virus in foliage.

Snowchip - Late maturing and highest yield at 142 day harvest. Higher marketable yield than Ontario with less pick outs. Similar to Ontario in after cooking darkening at two hours after cooling. Some severe vascular discoloration noted.

Yukon Gold - Medium maturity, golden flesh, and susceptible to scab. Tubers sized well. Optimum marketable yield in 115 days.

MS700-79 - Medium maturity with below average yields. No internal defects and chips well out of field. May have susceptibility to virus-mosaics.

MS700-83 - Medium-late maturity and above average yields. Round white, uniform appearance with minimal internal defects. Good chips out of field and no after-cooking-darkening. Yielded well in Presque Isle County demonstration plot and highest specific gravity. Also yielded above average in Bay County harvest August 17.

MS701-22 - Medium-late maturity, round white with below average yields.

MS702-80 - Round white, medium maturity, and medium specific gravity. Minimal internal defects and good chip quality. Some scab tolerance.

MS702-91 - Late maturing, round to oblong, white with yields substantially above average. Some internal necrosis and hollow heart noted. Good culinary qualities.

MS704-10 - Medium maturity, round, golden flesh cultivar with high specific gravity. Minimal internal defects and good chip color.

MS704-17 - Medium-late maturity with high yields. Round white with susceptibility to scab.

MS714-10 - Medium maturity with average yields. Oblong in shape and medium specific gravity. Some hollow heart noted.

MS716-15 - Medium maturing, round white with average yields, and high specific gravity.

MS718-6 - Medium-late maturity with average yields. Some after cooking darkening noted.

B7154-10 - Being deleted because of serious growth cracks and low specific gravity.

B7805-1 - Being deleted because of poor stands at all locations and below average yields.

B9540-62 - An oblong to long russet from the USDA-Beltsville breeding program. Low yields and specific gravity and poor tuber sizing as evidenced by high percentage of B size tubers. Some after-cooking-darkening after cooked tubers were allowed to cool.

C-13 - A medium-early selection from the Campbell breeding program. The yield performance was lower than normal and growth crack was more prevalent than usual.

#### USDA-Beltsville Trials

Four separate trials evaluating selections from the USDA-Beltsville potato breeding program were conducted in 1983. Cultural, fertility, and management practices used were the same as described in the dates of harvest study. Two studies were with russet and round white selections made from the Chapman Farm (Presque Isle, Maine) seed plot harvests in September, 1982. Two studies (russets and whites) were inter-regional trials conducted in conjunction with several other states.



Tables 4 and 5 summarize the yield data obtained from the 1982 Chapman Farm selections. Tuber sizing was limited as evidenced by the high percentage of tubers under 2" and the low percentage of tubers over 3½" diameter. In terms of overall performance no selections were judged to be better than Atlantic. Selections B8682-4, B9769-18, and B9792-9 will be tested again in 1984.

Sizing of the russet selections was very poor and specific gravity readings were below 1.075, a minimum level desired in long russets in Michigan. All selections, however, were substantially better than Russet Burbank in terms of pick outs and off type tubers. Selections B9752-7 and B9400-5 will be tested again in 1984.

Tables 6 and 7 summarize the yield data for the round whites and russets in the USDA-Beltsville inter-regional trial. All round-white selections yielded less than Atlantic and specific gravity readings were lower also. Foliar maturities for both the round-whites and russets were noted as medium-early to medium. The latest maturing selections as noted on August 20 were B8706-7 and C670-11 and comparable to Kennebec, Atlantic, and Russet Burbank. Hollow heart was noted in only Kennebec and C670-11 and no internal necrosis was noted. Considerable jelly end rot was noted on B9596-2.

Table 8 summarizes the yield data for the 13 cultivars which were selected at harvest from the approximately 225 eight hill plantings from the USDA-Beltsville seedlings. Four selections were deleted after harvest from further testing because of low specific gravity and severe vascular discoloration in B8687-8.

#### Overstate Demonstration Trials

Yield data were collected from two commercial farm locations in 1983. These were established as demonstration plantings and are not replicated plots. Plots were located at the Henry Mulders Farm in Munger and at the Wilks Farm in Posen. At the Mulders Farm the entire variety planting was harvested and graded and these data are reported in Table 9. Severe growth cracks were noted in B7154-10 and a very poor stand and heat sprout were noted with B7805-1. Both are being discontinued from any further testing in Michigan.

At the Wilks Farm three 15 foot areas from each variety were harvested, graded, and averaged to determine yield performance which is summarized in Table 10. Superior, MS704-17, MS700-83, and C-13 were located in sprayer rows so their yield potential was likely reduced. Considerable pick outs was noted with Yukon Gold, Ontario, C-13, and Jemseg and this was primarily severe growth cracks, knobby tubers, second growth and tuber greening. MSU seedling 700-83 produced good yields with a minimum of grade outs.



Michigan Table 4. Yield, size distribution, and specific gravity of several round white selections from the USDA-Beltsville breeding program.

Cultivar	Yield cwt/A		Percent Size Distribution			Pick Outs	Specific Gravity
	Total	No. 1	<2"	2-3 $\frac{1}{4}$	>3 $\frac{1}{4}$		
B9769-18	605	432	26	70	2	3	1.066
Atlantic	490	438	11	82	8	0	1.087
B8682-4	490	394	19	74	7	1	1.076
B8702-18	429	388	9	87	3	1	1.065
B8687-3	423	338	21	76	3	0	1.062
B9792-9	396	359	9	82	9	1	1.073
B9539-9	365	215	41	59	0	0	1.077
B8687-13	342	292	14	80	6	1	1.064
B9510-5	329	252	23	70	7	2	1.069
B9527-1	302	233	22	77	0	2	1.079
Superior	300	260	10	82	5	4	1.069
B9516-8	<u>219</u>	<u>206</u>	6	91	4	0	<u>1.078</u>
AVERAGE	391	317					1.072

Planted May 6; Harvested September 12, 1983.

Michigan Table 5. Yield, size distribution, and specific gravity of several russet selections from the USDA-Beltsville breeding program.

Cultivar	Yield cwt/A		Percent Size Distribution			Pick Outs	Specific Gravity
	Total	No. 1	<2"	2-3 $\frac{1}{4}$	>3 $\frac{1}{4}$		
B9752-7	503	411	18	61	21	2	1.068
B9400-5	475	388	15	43	40	3	1.069
R. Burbank	444	209	23	43	5	30	1.071
B9729-6	327	200	40	58	2	0	1.070
B9740-1	321	235	26	64	9	1	1.062
B9569-2	300	194	36	58	7	0	1.065
B9738-2	300	169	42	54	3	2	1.068
B9752-3	<u>263</u>	<u>119</u>	46	44	2	9	<u>1.066</u>
AVERAGE	366	240					1.067

Planted May 6; Harvested September 12, 1983.

Michigan Table 6. Yield, size distribution, and specific gravity of several round white cultivars. Inter-regional trial.

Cultivar	Yield cwt/A		Percent Size Distribution			Pick Outs	Specific Gravity	Chip <sup>2/</sup> Scores
	Total	No. 1	<2"	2-3¼	>3¼			
Atlantic	364	324	11	85	4	0	1.079	1.5
B8091-8	339	289	15	82	3	0	1.073	2.0
G670-11 <sup>1/</sup>	327	277	10	76	8	5	1.075	2.5
B8706-7	314	281	9	80	10	2	1.065	1.5
Onaway	304	262	12	75	12	3	1.057	3.5
B9340-13	293	250	15	85	0	0	1.072	2.0
B9384-4	291	204	30	70	0	0	1.066	1.0
B9140-32	276	241	13	87	0	0	1.077	1.0
B9224-6	262	227	13	82	5	0	1.061	1.5
Kennebec <sup>1/</sup>	241	175	20	69	4	8	1.059	2.0
Superior	239	212	7	82	6	4	1.059	2.0
B9192-1	<u>233</u>	<u>214</u>	8	88	3	0	<u>1.060</u>	1.5
AVERAGE	290	246					1.067	

Planted May 6; Harvested September 15, 1983.

1/ Selections from University of Guelph, Ontario Canada.

2/ Samples processed October 19. PC/SFA scale; 1 = lightest, 5 = dark and unacceptable.

Michigan Table 7. Yield, size distribution, and specific gravity of several russet cultivars. Inter-regional trial.

Cultivar	Yield cwt/A		Percent Size Distribution			Pick Outs	Specific Gravity	Comments
	Total	No. 1	<4 oz	4-10 oz	>10 oz			
B9553-6	476	372	17	62	17	5	1.065	Severe heat sprout
Belrus	318	167	46	50	3	1	1.074	
B9398-2	302	173	40	51	6	3	1.073	
R. Burbank	298	66	38	22	0	40	1.065	
B9648-9	275	143	46	51	1	3	1.056	Dark russet
B9596-2	270	141	36	45	7	12	1.058	25% jelly end rot
B9523-10	231	121	41	51	2	6	1.055	Some growth crack
B9540-62	222	112	44	49	2	5	1.062	Some vascular discoloration
Gold Rus	<u>191</u>	<u>87</u>	51	46	0	3	<u>1.068</u>	Some growth crack and vascular discoloration
AVERAGE	290	246					1.067	

Planted May 6; Harvested September 2, 1983.

Michigan Table 8. Yield, size distribution, and specific gravity of several cultivars selected at harvest from eight-hill plantings of USDA-Beltsville selections.

Cultivar	Yield cwt/A		Percent Size Distribution			Specific Gravity	Comments
	Total	No. 1	<2"	2-3¼	>3¼		
B8687-8	404	336	17	83	0	1.076	Severe vascular discoloration-discarded
B8687-10	471	413	13	77	10	1.071	Round, smooth
B8751-6	538	452	16	79	5	1.079	Round, smooth slightly flattened
B9541-45	384	375	3	83	14	1.070	Medium deep eyes-discarded
B9581-10	461	413	10	79	11	1.075	Oval, medium eye depth, slight net
B9638-11	452	336	25	72	3	1.084	Smooth, slightly flattened
B9718-2	404	221	45	48	7	1.063	Russet, discarded-low specific gravity
B9792-6	461	403	13	77	10	1.086	Round to oblong, deep eyes
B9792-84	576	499	13	80	7	1.085	Slight net, deep eyes
B9792-111	557	481	14	79	7	1.089	Deep eyes, some scab
B9792-119	500	471	6	77	17	1.081	Deep eyes, slight net, some scab
B9792-191	470	432	8	84	8	1.069	Discarded-low specific gravity
B9922-11	461	375	19	56	25	1.082	Russet, oblong, slightly flat

Michigan Table 9. The yield, size distribution, specific gravity, and chip quality of several potato varieties. Bay County, Henry Mulders Farm, Munger, Michigan. 1983.

Variety	Total (cwt/A)	U.S. No. 1 (cwt/A)	Percent Size Distribution				Specific Gravity	Chip <sup>1/</sup> Score
			Over 2-3½"	Under 3½"	Pick 2"	Outs		
Jemseg	356	319	82	8	7	3	1.070	1.5
Onaway	349	299	85	1	12	2	1.065	2.0
B7154-10	347	298	84	1	12	3	1.061	1.5
MS700-83	323	273	82	3	15	1	1.072	1.0
Yukon Gold	255	215	81	4	13	3	1.072	1.5
Oceania	250	227	88	3	9	0	1.073	1.0
C-13	194	156	78	2	19	0	1.066	1.0
B7805-1	<u>122</u>	<u>108</u>	82	7	11	0	<u>1.058</u>	1.5
AVERAGE	275	237					1.067	

Planted April 27; Harvested August 15, 1983.

<sup>1/</sup> PC/SFA scale; 1 = lightest, 5 = dark and unacceptable.

Michigan Table 10. The yield, size distribution, and specific gravity of several potato varieties. Presque Isle County, Wilks Farms, Posen, Michigan. 1983.

Variety	Total (cwt/A)	U.S. <sup>1/</sup> No. 1 (cwt/A)	Percent Size Distribution				Specific Gravity
			U.S. No. 1 Over 2-3½"	Under 3½"	Pick <sup>2/</sup> 2"	Outs	
Katahdin	409	352	50	36	5	9	1.068
Snowchip	377	330	70	17	8	5	1.076
Yukon Gold	385	328	60	25	3	12	1.077
700-83	358	319	82	7	10	1	1.084
704-17	332	308	77	16	7	0	1.078
Onaway	329	292	65	24	4	7	1.066
Ontario	332	273	73	9	8	10	1.070
Superior	260	236	74	17	9	0	1.075
Atlantic	241	214	79	10	11	0	1.083
CA 13	252	207	64	19	3	14	1.075
Jemseg	<u>184</u>	<u>145</u>	44	36	4	16	<u>1.068</u>
AVERAGE	314	273					1.075

Planted June 7; Harvested October 12, 1983.

<sup>1/</sup> U.S. No. 1's consists of potatoes 2-3½" plus those over 3½".

<sup>2/</sup> Pick outs consisted mainly of growth cracks, knobs, irregular shape, and serious greening.

## MINNESOTA

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### Introduction

This past year, two advanced selections were named. MN7973 was named Tolaas, in honor of Arnold Tolaas, first head of Seed Potato certification, Minnesota Department of Agriculture from 1920-1955. Tolaas has excellent french fry quality and flake quality. It has acceptable boiling and baking qualities. It produces large tubers fairly early. It appears adapted to the heavier soils of the Red River Valley as well as to the peatlands. Table 1 summarizes its characteristics.

The other selection, MN8757, was named Reddale. This is primarily a fresh market potato. It appears to have good resistance to common scab. Color appears to stay uniform on the mineral peats. It can produce an excess of large tubers. The characteristics for Reddale are summarized in Table 2.

Minnesota Table 1. Summary of performance for Tolaas (MN7973), 1979-1983.

1. Parentage: Neb 16.55-1 x MN 1106.64-1.
2. Maturity: Midseason.
3. Tuber shape: Long.
4. Tuber color: White-sometimes russet.
5. Specific gravity: Medium.
6. Eating quality: Boiled, fair; Bake, good; French fry, excellent.
7. Chipping quality: Marginal; Flakes, excellent.
8. Hollow heart resistance: High.
9. Disease resistance: Common scab, high; Late blight, intermediate field resistance; Verticillium wilt, low; susceptible to viruses X, Y, and leaf roll.
10. Area of adaptation: Red River Valley and peatlands.
11. Strengths: Produces large tubers early, excellent french fry and flake quality.
12. Weaknesses: Stand due to large seed tubers.
13. Data: Red River Valley and Anoka, 1979-1983.

<u>Location</u>	<u>Variety</u>	<u>Maturity</u> <sup>1</sup>	<u>Tuber</u> <sup>2</sup> <u>type</u>	<u>Marketable</u> <sup>3</sup> <u>yield</u>	<u>Specific</u> <u>gravity</u>	<u>Hollow</u> <sup>4</sup> <u>heart</u>
RRV	Burbank	5.3	4.1	23.2	1.083	1.1
	Kennebec	4.7	3.5	36.3	1.078	1.9
	MN 7973	3.8	2.4	34.0	1.078	0.2
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Anoka	Anoka		1.8	31.3	1.070	0.0
	MN 7973		1.6	35.6	1.069	0.1

- 1 Scale, 1-6: 1, early; 6, late.
- 2 Scale, 1-5: 1, good; 5, bad.
- 3 20 hill plots, lbs.
- 4 Number of hollow tubers from 6 per plot.

Certified seed available: 315 tons.  
Test tube disease tested stock available.



Minnesota Table 2. Summary of performance for Reddale (MN8757), 1979-1983.

1. Parentage: Erik x Chieftain.
2. Maturity: Midseason.
3. Tuber shape: Blocky.
4. Tuber color: Red
5. Specific gravity: Low.
6. Eating quality: Boiled, fair; Baked, poor; French fry, poor.
7. Chipping quality: Poor.
8. Hollow heart resistance: Intermediate-only very large tubers hollow.
9. Disease resistance: Common scab, high; Late blight immunity gene; Verticillium wilt, low; susceptible to leaf roll virus.
10. Area of adaptation: Red River Valley and mineral peats.
11. Strengths: Yield, high scab resistance for a red, hold color well on mineral peat soils.
12. Weaknesses: Tuber size increases very quickly so growers have to watch it closely.
13. Data: Red River Valley and Anoka, 1979-1983.

<u>Location</u>	<u>Variety</u>	<u>Maturity</u> <sup>1</sup>	<u>Tuber</u> <sup>2</sup> <u>type</u>	<u>Marketable</u> <sup>3</sup> <u>yield</u>	<u>Specific</u> <u>gravity</u>	<u>Hollow</u> <sup>4</sup> <u>heart</u>
RRV	Norland	2.0	2.1	34.1	1.075	0.60
	Pontiac	4.5	3.3	43.3	1.075	0.38
	MN 8757	4.4	2.8	44.6	1.076	1.40
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Anoka	Chieftain		2.8	29.5	1.066	0.17
	MN 8757		2.8	35.7	1.060	0.33

- 1 Scale, 1-6: 1, early; 6, late.
- 2 Scale, 1-5: 1, good; 5, poor.
- 3 20 hills plot, lbs.
- 4 Number of hollow tubers, from 6 per plot.

Foundation and Certified seed available: 150 tons.  
Test tube disease tested stock available.

## NEBRASKA

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Clonal Strains From Stem Cuttings. Clonal strains of Monona, Norchip, Dark Red Norland and Norgold developed from 1979 stem cuttings were compared for differences in yield and quality. All clones tested were free from visible virus and PVX. Significant differences in yield, grade defects and specific gravity were noted among clones within varieties.

Two years of data for Monona and Norchip are presented (Nebraska Table 1). The apparent best clones of Monona in terms of yield and specific gravity are clones #4, #7, #35, and #37. The Norchip clones #9, #18, #30 and #34 are the better clones in terms of yield, tuber appearance and freedom from growth cracks. Seed stocks of these clones were made available to growers in 1982 and 1983.

Single year (1982) trials indicated the apparent better clones of the other varieties are: Norgold R - #5, #6, #14, #15; Norgold M - #47; Dark Red Norland - #6, #35.

Chipping Variety Development. In long-time storage studies in 1983 the following selections were equal to Norchip in chipping quality: Belchip, Croatan, Neb. 9.75-1, Neb. 36.78-1, BN 9805-2, BN 9855-5 (Rus), BN 9855-6, BN 9803-1, BN 9855-6. Seed stocks of these selections were increased in 1983 (Nebraska Table 2).

Insect and Disease Survey of Commercial Fields-1982. Insect counts taken on four dates from six commercial fields are presented in the attached tables. The fields were located in the Pumpkin Creek (West of Harrisburg), Bayard, Angora and Alliance areas.

Aphid populations were higher in Pumpkin Creek and Bayard locations possibly due to the prevalence of alfalfa fields in those areas. Psyllids were not a significant problem in any area. Leafhoppers were the major problem in all areas, especially in the Alliance and Pumpkin Creek fields. Flea beetles were a potential problem but they were controlled. Colorado potato beetles were no problem. Thrip populations were high (Nebraska Table 3).

Nebraska Table 1. Yield and grade quality of clonal selections from stem cuttings, 1981 and 1982.

<u>Variety</u>	<u>Clone</u>	<u>Yield</u>	<u>% US#1</u>	<u>Gravity</u>	<u>PCII</u>	<u>Defects</u>
<u>1/</u>					<u>2/</u>	<u>3/</u>
cwt/A Averages for two years						
Monona	4	282	75	1.076	3	SG
	5	279	68	1.075	3	OT
	7	287	73	1.073	3	OT
	17	212	58	1.071	3	OT
	32	253	59	1.068	3	K
	35	324	73	1.069	3	SG
	37	266	70	1.073	3	OT
	43	285	70	1.073	3	K, BE
	45	245	61	1.069	3	K
	<u>47</u>	<u>275</u>	<u>64</u>	<u>1.077</u>	<u>3</u>	<u>OT</u>
Average		271	67	1.072	3	
Norchip	4	361	52	1.079	3	GC
	9	296	59	1.081	3	K
	18	288	48	1.082	4	K
	22	227	50	1.083	3	K
	29	253	55	1.082	3	OT
	30	290	58	1.083	3	K
	34	287	54	1.083	3	K
	41	222	53	1.080	3	GC, K
	<u>48</u>	<u>236</u>	<u>47</u>	<u>1.072</u>	<u>3</u>	<u>K</u>
Average		246	48	1.073	3	

1/ 1981 - Planted May 26; harvested September 18.

1982 - Planted may 26; harvested September 22.

Spacing 9" x 36"; 4 Replicates of 20-hills; fertilizer 100-100-0.

2/ PCII Chip color 1 to 10; 1 to 4 acceptable.

3/ BE = Bulged Eye; SG = Sun Green; GC = Growth Crack;  
P = Pointed Ends; = Knobs; OT = Off-Type.

Nebraska Table 2. Yield and quality of potatoes in the Scottsbluff, trial in 1983.

<u>Entry</u> <sup>1/</sup>	<u>Yield</u> Cwt/A	<u>US#1</u> %	<u>Over 4</u> %	<u>Sortout</u> %	<u>Under 2</u> %	<u>Sp. Gr.</u>	<u>PCII</u>	<u>Defects</u> <sup>2/</sup>
Belchip	513	67	11	9	13	1.089	2	OT-MI-SR
9.75-1	419	73	7	12	7	1.085	2	GC-MI-BE
A26.72-2	383	60	7	21	13	1.095	4	GC-OT-MI
BN9855-2	380	49	20	27	5	1.094	3	K-MI-BE
BN9896	377	57	0	22	21	1.094	3	OT-K-BE
BN9826-5	376	58	5	23	14	1.073	4	GC-MI-DR
Norchip	369	59	8	13	19	1.081	2	K-GC-OT
Norgold M	353	28	32	31	9	1.072	6	K-GC-MI
BN9855-6	339	64	0	17	19	1.084	1	MI-PE-SG
36.78-1	316	72	0	4	24	1.072	3	MI
Monona	316	61	10	16	13	1.069	3	MI-ROT-OT
A131-4	310	76	2	9	12	1.089	1	GC-MI-K
BN9820-4	271	58	17	15	10	1.075	4	MI-GC-K
A153.692	248	38	12	43	7	0.000	6	KMI-SG
BN9805-2	246	61	10	16	13	1.087	1	MI-GC-PE
A14970-1	230	45	41	12	2	1.073	4	K-OT-GC
CHIPBELLE	204	66	3	17	14	1.094	2	MI-SR
CROATAN	199	69	0	22	9	1.070	2	OT-K-MI
BN983-1	187	40	9	36	15	1.088	5	PE-GC-MI
BN9855-5	170	59	2	32	7	1.079	2	MI-GC-OT
BN9803-3	148	54	0	16	30	1.080	3	MI-GC
BN9803-1	141	77	0	17	6	1.091	2	MI-GC-BE

<sup>1/</sup> Planted May 18, 1983; Harvested September 22, 1983  
20 - Hills (9.6 in. x 36 in.); 2 Replicates.

<sup>2/</sup> BE = Bulged Eye, SG = Sungreen, OT = Off Type, GC = Growth Crack,  
MI = Irregular Shape, = Pointed End, K = Knob.

Nebraska Table 3. Insect populations in commercial potato fields in  
1982 Nebraska Panhandle.

Insects	Location <sup>1/</sup>						Ave.
	1	2	3	4	5	6	
Ave. counts/100 sweeps)							
Colorado Potato Beetle	0	7	0	0	0	4	2
Psyllids	4	12	13	1	6	2	6
Aphids	20	8	28	8	2	4	12
Leafhoppers	47	196	126	69	270	252	160
Flea Beetles	6	106	3	1	2	11	22
Thirps	76	156	94	19	53	72	78
Diptera	88	197	152	90	233	166	154
Orthoptera	0	1	0	0	0	0	T
Lygus	4	109	17	7	15	47	40
Hymenoptera	17	39	13	9	31	25	22
Ladybird Beetles	1	3	4	4	1	6	3
Neuroptera	1	2	8	1	2	6	3
Nabids	6	27	3	3	11	12	10
Misc. Insects	4	18	4	3	5	5	7
Spiders	3	8	7	3	4	6	5
Totals	316	889	635	627	473	218	526

\*T = Trace numbers found.

<sup>1/</sup> Location:

- 1 = Pumpkin Creek (West of Harrisburg)
- 2 = Bayard
- 3 = West of Angora
- 4 = North of Angora
- 5 = West of Alliance
- 6 = North of Alliance

Tuber samples (500) were taken from random spots in the six fields for Florida testing. Samples were also saved for chipping at harvest and after three and six months of storage at 50° F.

No haywire, hairsprout or sterile tubers were found in any lot in the Florida tests. Virus diseases were also not noted.

Only normal chip quality and sugar contents (sucrose and glucose) were found at harvest or after long time storage at 50° F. Severely discolored chips were not of any consequence.

North Central States Processing Study. Standard potato varieties and advanced selections obtained from the North Central Regional Trials and Canada in 1982 were analyzed for sucrose (SR rating), glucose and chip color at harvest and after 50° F storage. Protein contents of tubers and oil contents of chips were also determined (Nebraska Table 4).

The relationship of sucrose content (SR rating) at harvest time to long-time chipability was studied for the sixth year. The average sucrose content of the cultivars ranged from 0.70 to 1.9 mg/g which was lower than the ranges in 1977 through 1981. The average color of chips after six months of storage in 1978 through 1982 was not correlated with average SR rating nor was SR rating correlated with vine maturity in any of the years. Glucose contents after longtime storage were not correlated with SR ratings nor vine maturity but were highly correlated with chip color after six months storage in all years with r-values ranging from 0.877 to 0.980.

Protein contents of tubers in 1982 ranged from 3.34 to 5.16 percent. Protein content was not correlated with SR rating or vine maturity in any of the years from 1977 through 1982.

The average sucrose contents (SR ratings) of samples from various locations ranged from 0.6 to 2.6 mg/g and were lower than in previous years. Contrary to previous years sucrose contents at harvest were correlated with length of growing season ( $r = -0.693$ ) Average protein contents of samples ranged from 2.50 to 7.49 percent. Protein content was correlated with length of growing season ( $r = 0.537$ ) which is contrary to previous years.



Nebraska Table 4. Chip color sugar and protein contents of potatoes in the NCS trials 1982.

	Vine	Sucrose	PCII*	PCII*	PCII*	Glucose	Protein
<u>Selection</u>	<u>Maturity</u>	<u>(1)**</u>	<u>(1)**</u>	<u>(3)</u>	<u>(6)</u>	<u>(6)</u>	<u>          </u>
		mg/g	Averages for 10 locations			(%)	(%)
LA 42-38	3.8	1.9	4.9	6.1	5.5	0.88	4.58
ND 55-7	2.3	1.9	4.3	6.2	7.1	0.94	4.81
MN 10504	2.7	1.8	4.0	6.2	5.0	0.85	3.87
Red Pontiac	3.8	1.8	5.8	7.0	7.0	1.26	4.18
Norchip	3.0	1.7	3.7	5.0	5.0	0.55	4.69
Norgold	2.5	1.6	5.4	6.8	7.3	1.24	5.16
MN 10162	3.5	1.6	3.7	4.9	3.5	0.36	4.54
NE 143.70-2	3.0	1.5	6.1	7.7	8.0	1.40	4.51
MN 9569	2.5	1.5	5.2	6.6	7.0	1.12	3.83
NE A63.71-1	4.4	1.3	5.3	6.6	6.2	0.90	3.97
Wisc. 806R	3.3	1.2	5.7	7.6	7.6	1.16	4.95
NE A71.72-1	3.2	1.0	4.5	6.1	5.4	0.89	4.20
Wisc. 752	3.4	1.0	4.4	5.6	5.1	0.64	4.20
Rus. Burbank	4.0	0.9	4.8	5.5	4.6	0.44	3.44
Norland	1.5	0.9	4.6	6.5	6.4	1.13	4.54
ND 534-4	2.7	0.7	4.8	6.9	5.9	0.85	3.35
<u>ND 388</u>	<u>2.8</u>	<u>0.7</u>	<u>4.9</u>	<u>6.1</u>	<u>5.2</u>	<u>0.75</u>	<u>4.59</u>
Average	3.1	1.3	4.8	6.3	5.9	0.91	4.31

Correlation  
with Sucrose: 0.089                      -0.058                      0.191

\* PCII Chip Color = 1 to 10 scale.

\*\* Number in parentheses = approximate number months after harvest.

1/ Treated with Fusarex.

2/ Correlation with maturity = -0.323; Correlation with PCII (6) = 0.803.\*\*

3/ Correlation with maturity = -0.274.

The relationships between chip yield, oil content and dry matter content were determined for the years 1980, 1981 and 1982 (Nebraska Table 5). Chip yield for genotypes was highly correlated with dry matter content in all years. Oil content of chips was inversely correlated with dry matter content in all years. Chip yield and oil content were inversely correlated. Wisc. 723, Wisc. 752, MN 9319, MN 10162, NE A129.69-1, and LA 42-38 were equal to or better than Norchip in chip yield with low oil contents.

Potatoes as an energy resource. Cultivars (genotypes) of potatoes were grown with three levels of insect and disease control at the UNL Panhandle Station in 1981 and 1982. The levels of control were: 1) Complete (systemic insecticide at planting time plus weekly insecticide and fungicide applications); 2) standard (systemic insecticide plus 1 or 2 foliar sprays) and 3) minimum (no systemic chemicals applied and zero to one foliar spray).

The average yields with the minimum control treatment were reduced by 59 and 8 percent in the years 1981 and 1982 respectively (Nebraska Table 6). No insecticides were used in 1981 but one foliar application of Pydrin was used early in the season in 1982. Insect counts were higher in 1982 than 1981 except in the minimum control plots where the reverse was true. The results indicate the necessity for the use of either systemic insecticide at planting time or a limit number of foliar sprays. Complete control with systemic insecticide plus weekly foliar insecticide and fungicide sprays were costly and no more effective than the standard control practice.

The percentages of sort-out potatoes due to deformed potatoes was greater in the complete and standard control plots than in the minimum control, contrary to what might have been expected. However, the rate of tuber development as well as the size of mature tubers was reduced by heavy insect and disease (early blight) infestation in the minimum control plots. Consequently, "second growth" deformities were restricted. Dry matter content was also increased in potatoes from the minimum control plots due to induced early maturity.

Nebraska Table 5. Dry matter content, chip yield and oil content of potato chips from NCS Trials, 1980 - 1982.

<u>1980</u>				<u>1981</u>				<u>1982</u>			
<u>Selection</u>	<u>Dry Matter</u> %	<u>Chip Yield</u> #/cwt	<u>Oil Content</u> %	<u>Selection</u>	<u>Dry Matter</u> %	<u>Chip Yield</u> #/cwt	<u>Oil Content</u> %	<u>Selection</u>	<u>Dry Matter</u> %	<u>Chip Yield</u> #/cwt	<u>Oil Content</u> %
Red Pontiac	16.0	29.1	50.1	Red Pontiac	16.4	30.5	48.0	Red Pontiac	17.1	28.1	40.4
Norland	15.6	29.2	49.8	Norland	16.0	29.1	46.6	Norland	16.8	28.3	38.6
Norchip	18.8	32.4	46.7	Norchip	19.3	33.4	44.9	Norchip	19.9	31.6	37.4
R. Burbank	18.6	32.0	46.4	R. Burbank	18.9	34.2	41.8	R. Burbank	19.4	31.7	37.3
Wisc. 723	19.0	33.0	46.1	NE A129.69-1	18.4	34.0	44.9	NE A143.70-2	18.2	27.6	38.6
Wisc. 726	18.2	32.3	47.1	NE 219.70-3	17.4	31.3	46.2	NE 71.72-1	18.9	29.9	40.3
Wisc. 806R	17.1	30.2	47.3	NE 7.67-1	16.4	29.4	49.6	NE 63.71-1	19.0	30.7	37.5
ND 146-4R	16.8	30.5	49.3	MN 9781	19.5	33.2	46.2	MN 9569	19.0	28.1	40.6
TND 14-1	17.2	30.4	47.0	MN 8777	17.4	31.0	47.9	MN 10162	20.6	31.6	37.4
NE 219.70-3	17.4	32.3	47.2	MN 10162	20.1	33.3	44.6	MN 10504	19.0	31.3	38.6
NE 129.69-1	17.3	31.0	48.0	IA 7196	17.3	29.8	48.6	IA 42-38	19.9	31.2	37.6
NE 71.72-1	17.6	31.7	48.1	IA 31-124	17.1	31.7	45.6	Wisc. 752	22.5	32.6	34.8
MN 9319	17.9	32.6	46.9	Wisc. 726	19.0	33.3	45.1	Wisc. 806R	18.9	28.9	38.3
MN 8757	16.1	28.8	50.5	Wisc. 774R	16.8	30.2	47.7	ND 388	19.6	29.4	38.6
MN 8742	17.3	29.9	47.5	ND 146-4R	17.1	33.1	47.2	ND 534-4	18.9	29.4	39.8
AK 34-2	17.5	31.6	46.7	ND 119-3	16.9	30.8	47.4	ND 55-7	18.7	29.3	39.9
IA 42-38	18.0	31.3	48.6	ND 55-7	18.1	31.9	47.0	Norgold	18.3	28.6	35.6

Correlations (r)

Chip Yield vs.			
Dry Matter	0.893**	0.832**	0.793**
Oil Content vs.			
Dry Matter	-0.840**	-0.687**	-0.544*
Chip Yield vs.			
Oil Content	-0.808**	-0.798**	-0.568*

Nebraska Table 6. Effect of insect and disease control levels on potato levels on potato yelds and quality (1981, 1982).

<u>Control</u> <sup>1/</sup> <u>Levels</u>	<u>Insect</u> <sup>2/</sup> <u>Counts</u>	<u>Total</u> <sup>3/</sup> <u>Yield</u> Cwt/A	<u>Sort</u> <u>Outs</u> %	<u>B-Size</u> <u>1 7/8"</u> %	<u>Dry</u> <u>Matter</u> %
Complete					
1981	173	229	35	10	19.2
1982	283	316	19	10	19.6
Standard					
1981	223	215	30	19	19.2
1982	328	304	25	6	19.4
Minimum					
1981	1143	90	13	66	-
1982	571	284	22	9	20.5

<sup>1/</sup> Complete = Systemic insecticide at planting time plus weekly spray with insecticides and fungicide.

Standard = Systemic insecticide at planting time plus one or two sprays as needed based on monitoring.

Minimum = No pesticides applid in 1981; one spray with Pydrin and Bravo in 1982.

<sup>2/</sup> Averages per 50 sweeps/week.

<sup>3/</sup> All data are averages for 22 cultivars in 1981 and 16 in 1982.

Total fermentable carbohydrates was highest with the minimum control treatment in 1982 due to increased starch contents. Starch and fermentable carbohydrates were higher with the standard treatment than the complete control treatment. Potatoes were more mature in the minimum control plots (Nebraska Table 7).

Higher yields of ethanol (gal/acre) were recovered from potatoes in the minimum and standard control plots in 1982 than in the complete control plots. The ethanol yields were correlated with the higher starch and fermentable carbohydrate yields as well as ethanol recovery (gal/cwt) from the minimum and standard control plots (Nebraska Table 8).

The differences among control level treatments were significant for tuber size, dry matter content, total fermentable carbohydrates and ethanol production per cwt and per acre. Differences among cultivars were significant for yield (cwt/acre) tuber size, dry matter content, total fermentable carbohydrates and ethanol recovery per cwt and per acre.

Nebraska Table 7. Effect of insect and disease control levels on carbohydrate contents in potatoes.

<u>Control<sup>1/</sup></u> <u>Levels</u>	<u>Content in Potatoes<sup>2/</sup></u>			<u>Fermentable<sup>3/</sup></u> <u>Carbohydrates</u>
	<u>Starch</u> %	<u>Sucrose</u> %	<u>Glucose</u> %	
Complete				
1981	13.5	0.42	0.66	14.6
1982	12.9	0.33	0.46	13.7
Standard				
1981	13.5	0.44	0.77	14.0
1982	13.7	0.38	0.28	14.4
Minimum				
1981	12.6	0.46	0.71	13.8
1982	14.7	0.24	0.28	15.2

<sup>1/</sup> Complete = Systemic insecticide at planting time plus weekly spray with insecticides and fungicide.

Standard = Systemic insecticide at planting time plus one or two sprays as needed based on monitoring.

Minimum = No pesticides applied in 1981; one spray with Pydrin and Bravo in 1982.

<sup>2/</sup> Starch estimated by standard regression on dry matter content; sugars determined by the modified Hassid acid hydrolysis method.

<sup>3/</sup> Total for starch plus sugar contents.



Nebraska Table 8. Effect of insect and disease control levels on carbohydrate and ethanol production from potatoes.

<u>Control<sup>1/</sup></u> <u>Levels</u>	<u>Starch</u> lbs/Acre	<u>Fermentable</u> <u>Carbohydrates</u> lbs/Acre	<u>Ethanol</u> gal/cwt	<u>Production<sup>2/</sup></u> gal/Acre
Complete				
1981	3091	3339	0.89	203.8
1982	4076	4326	0.51	161.2
Standard				
1981	2902	3014	1.09	234.3
1982	4164	4365	0.70	212.8
Minimum				
1981	1134	1239	0.71	63.9
1982	4189	4338	0.63	178.9

<sup>1/</sup> Complete = Systemic insecticide at planting time plus weekly spray with insecticides and fungicide.

Standard = Systemic insecticide at planting time plus one or two sprays as needed based on monitoring.

Minimum = No pesticides applied in 1981; one spray with Pydrin and Bravo in 1982.

<sup>2/</sup> All data are averages for 22 cultivars in 1981 and 16 in 1982; the recovery of ethanol from various cultivars ranged from 0.31 to 1.50 gal/cwt and 104 to 639 gal/acre.

Potato Variety Evaluation

Exp. No.	Rows	Size	Reps	<u>D a t e s</u>		Soil Texture
				Planting	Harvesting	
1	Single	15' long x 3' wide	1	4/29	8/10-12	loamy sand
2	Single	15' long x 3' wide	2	4/29	8/10-12	loamy sand
3	Single	15' long x 3' wide	4	4/29	8/10-12	loamy sand
4	Single	21' long x 3' wide	4	4/29	8/10-12	loamy sand
5	Double	12' long x 3' wide	4	5/5	8/15	loam
6 <sup>1</sup>	Double	12' long x 3' wide	4	5/6	9/21	loam

Commercial cultural practices were used on all experiments, irrigation supplemented natural rainfall. Specific gravities were determined by the air and water method.

Key to Rating System

Air Pollution: 1 = very severe, 3 = severe, 5 = moderate, 7 = slight, 9 = none.

Maturity: 1 = v. early, 5 = medium, 9 = v. late.

Tuber Color: 1 = purple, 2 = red, 3 = pink, 4 = dk. brown, 5 = brown, 6 = tan, 7 = buff, 8 = white, 9 = bright white.

Tuber Texture: 1 = part rus., 2 = heavy rus., 3 = mod. rus., 4 = light rus., 5 = net, 6 = sl. net, 7 = mod. smooth, 8 = smooth, 9 = v. smooth.

Tuber Shape: 1 = round, 2 = most rd., 3 = rd. to oblong, 4 = most obl., 5 = obl., 6 = most obl., 7 = obl. to long, 8 = most long, 9 = long.

Tuber Depth: 1 = v. flat, 5 = ok depth, 9 = excellent depth.

Tuber Conformation\* & Field Rating\*: 1 = v. poor, 5 = fair, 9 = excellent.

Eye Depth: 1 = v. deep, 5 = medium, 9 = v. shallow.

Second Growth\*, Growth Crack\*, Heat Sprout\*, Hollow Heart\*, Heat Necrosis\*, Early Blight\*: 1 = very severe, 3 = severe, 5 = moderate, 7 = slight, 9 = none.

Chip Color: First value is 3 days after harvest, second value a week later, etc. 1 = v. light, 5 = borderline, 8 = v. dark.

\*Seven or above is considered acceptable.

<sup>1/</sup>Yield of a standard variety in the same test.

<sup>2/</sup>Specific Gravity of a standard variety in the same test with the 1.0 omitted.

New Jersey Table. A summary of six variety trials grown at three locations in New Jersey - 1983.

Air Pollution	Maturity	Color	Texture	Shape	Depth	Conformation	Eye Depth	Second Gr.	Growth Cr.	Heat Sprout	Hollow Heart	Heart Necrosis	Early Blight	Exp. No.	Seedling	Market Yield cwt	Total Yield cwt	Specific Gravity	% Culls	% under 1-7/8"	% 1-7/8-2-1/2"	% 2-1/2-3-1/4"	% over 3-1/4"	Field Rating	Chip Color
2	2	8	9	1	8	7	6	9	9	9	0	0	7	1	B6969-	94 152 <sup>1/</sup>	113 167 <sup>1/</sup>	60 63 <sup>2/</sup>	0	17	67	12		7	
	2	8	8	1	9	8	8	9	9	9	0	0		5	B6969-	99 131	126 168	57 58		22	59	17	2	7	
3	2	8	8	2	7	7	8	9	9	7	0	0	7	4	B6969-	95 145	128 159	60 62		25	66	9	0	6	
4	5	6	5	2	6	7	8	9	9	9	0	0	6	2	B8682-	76 82	136 119	73 68	1	41	56	1		6	
5	4	7	7	1	8	7	8	4	9	9	0	37	3	1	B8682-	155 188	197 204						6		
3	4			3		5	4	9	6		0	0	5	1	B8683-	144 188	227 204						4		
2	2	8	9	1	7		4	9	6		0	0	7	1	B8683-	89 188	115 204						4		
8	7			2			2	9	1		0	18	9	1	B8684-	145 188	191 204						2		
6	4	8	8	6	2		8	2	9	9	0	0	5	2	B8687-	33 82	164 119	67 68	45	33	21	1	1		
7	5	8	8	2	7		9	9	9		0	0	7	1	B8687-	30 188	54 204						5		
6	3	8	9	2	6		4	9	4		0	0	7	1	B8687-	137 188	182 204						5		
3	4	9	8	1	8	8	9	6	9	9	0	0	5	2	B8687-	119 82	160 119	72 68	2	26	59	13	7	5566	
7	5	7	6	2			6	9	7		0	16	9	1	B8687-	62 188	90 204						5		
3	4			2			9	9	9		0	0	7	1	B8687-	24 188	99 204						3		
5	4	9	9	5	7	3	9	3	9	9	0	0	5	1	B8702-	22 152	74 167	54 63	21	50	27	3	2		
7	6	6	6	2	5		1	9	6		0	36		1	B8706-	169 188	190 204						5		
	4	7	7	2	7	6	6	3	9	4	0	0		5	B8706-	116 131	163 168	50 58		30	56	13	1	5	
3	4	6	5	2	6	6	6	9	9	9	0	0	5	1	B8706-	99 152	125 167	70 63	0	22	70	8	6		
7	4	6	7	1	8	7		9	9	9	0	0		1	B8706-	87 188	102 204						7		
	2	7	5	2	6	6	7	9	9	9	0	0		5	B8706-	141 131	172 168	72 58		18	68	14	0	7	
3		7	6	2	8	7	8	6	9	7	0	18		5	B8798-	223 131	266 168	66 58		16	61	22	1	6	
6	4	9	9	3	5	4	8	9	6	9	0	0	3	1	B9071-	45 152	101 167	67 63	0	54	46	0	4		
6	5	7	6	1	9	8	8	7	9	9	0	0	5	2	B9140-	98 82	119 119	80 68	3	23	61	13	7	2235	
3		6	5	2	8	8	8	8	9	9	0	37		5	B9140-	208 131	247 168	72 58		16	65	17	2	8	
6	5	7	7	1	8	8	9	8	9	9	0	0	5	4	B9140-	165 145	178 159	75 62		8	73	20	0	7	2223
		6	6	1	8	8								6	B9140-	273 183	291 194	76 60		06	52	38	4	8	
2		8	8	2	8	7	8	9	9	9	16	27		5	B9192-	245 131	265 168	56 58		8	32	38	22	9	
2		6	8	2	8	7	8	9	9	7	0	0		5	B9224-	186 131	231 168	63 58		20	55	20	5	8	
5	2	8	7	1	7	8	7	9	7	9	0	0	3	1	B9335-	88 152	125 167	65 63	0	29	61	9		6	
3		7	7	2	8	8	7	8	9	9	0	0		5	B9340-	155 131	180 168	67 58		15	54	28	3	8	

New Jersey Table. A summary of six variety trials grown at three locations in New Jersey - 1983 - Continued

Air Pollution	Maturity	Color	Texture	Shape	Depth	Conformation	Eye Depth	Second Cr.	Growth Cr.	Heat Sprout	Hollow Heart	Heat Necrosis	Early Blight	Exp. No.	Seedling	Market Yield cwt	Total Yield cwt	Specific Gravity	% Culls	% under 1-7/8"	% 1-7/8-2-1/2"	% 2-1/2-3-1/4"	% over 3-1/4"	Field Rating	Chip Color			
1	6	7	2	6	8	8	7	9	7	0	87	5	B9384-	4	167	131 <sup>1/</sup>	222	168 <sup>1/</sup>	61	58 <sup>2/</sup>	25	56	19	0	7			
8	6	4	3	5	4	5	8	5	6	0	0	6	B9391-	2	128	128	168	159	63	67	23	59	16	0	6			
2	5	4	5	7	2	8	5	9	6	0	0	0	B9398-	2	82	73	132	140	68	58	38	62			4			
	5	4	5	7	6	8	5	7	8	0	0	0	B9398-	2	166	131	216	168	73	67	23	65	12	0	6			
	4	3	8	6	5	5	7	9	9	0	18	0	B9398-	2	146	128	187	159	60	67	19	45	30	01	6			
	5	3	7	7	6	8	5	9	7	0	0	0	B9399-	1	157	128	192	159	60	67	16	48	29	04	8			
6	6	5	4	6	5	6	8	5	9	7	0	28	8	3	B9400-	5	82	73	123	140	33	67			6			
6	5	7	5	2	6	5	7	9	9	18	0	5	B9423-	4	80	152	155	167	60	63	45	31	14		4			
3	3	7	8	2	6	8	9	9	9	0	0	6	B9510-	5	57	82	76	119	66	68	26	63	11		6	5434		
2	8	8	3	6	6	5	8	9	9	0	18	0	B9510-	5	164	131	207	168	61	58	21	56	21	2	6			
3	3	8	7	3	7	6	5	7	9	0	17	3	B9510-	5	134	145	151	159	64	62	11	55	30	4	6			
7	6	8	8	2	6	6	6	9	9	0	37	7	1	B9514-	17	131	188	165	204	61	58				6	2222		
2	9	8	2	8	8	7	9	7	9	0	0	0	5	B9514-	38	181	131	225	168	61	58	20	54	23	3	8	3324	
3	3		2	6	6	7	9	9	9	0	0	7	1	B9516-	6	82	188	84	204						6			
1	2	7	8	2	7	6	7	9	6	9	0	0	1	B9516-	8	130	152	141	167	76	63	3	55	36		7	2221	
D	1	6	8	4	5	5	8	6	9	9	0	0	5	1	B9518-	3	48	152	69	167	74	63	0		4			
7	5	8	8	6	6	6	6	9	7	0	0	9	1	B9527-	1	137	188	145	204						6			
3	3	8	8	7	7	7	8	8	7	9	17	18	5	B9527-	1	160	131	186	168	74	58	13	59	25	3	6		
3	3	7	7	2	8	6	7	9	9	0	18	5	1	B9528-	10	111	188	128	204	60	58				6			
2	7	5	2	7	6	7	8	5	9	0	0	0	5	B9528-	10	139	131	166	168	58	58	16	50	24	9	5		
5	7	8	8	5	7	2	1	7	9	9	0	0	7	1	B9530-	4	223	188	249	204					7			
7	4	6	8	2	6	7	8	7	9	9	0	0	7	1	B9532-	3	203	188	239	204	68	58			8	4233		
4	7	6	2	7	6	7	7	6	9	8	0	0	5	B9532-	3	171	131	245	168	62	58	31	56	13	0	6		
6	5	7	7	2	8	7	3	9	9	0	0	0	1	B9533-	12	205	188	221	204	72	58				7	3335		
6	8	8	7	2	5	5	5	9	6	0	27	9	1	B9535-	1	114	188	162	204						5			
7	7	8	7	6	8	4	7	3	9	6	0	0	9	1	B9535-	9	89	152	121	167	67	63	8	21	60	9	5	
2	6	7	6	3	6	5	5	6	9	9	0	0	7	1	B9536-	2	81	152	106	167	71	63	0	30	65	5	5	
6	6	8	7	3	5	6	7	6	7	5	0	0	9	1	B9536-	8	153	152	168	167	60	63	0	11	58	30	6	
6	8	7	6	1	8	7	7	2	9	8	0	18	7	1	B9536-	11	165	188	205	204					5			
5	7	6	2	6	5	5	8	6	9	9	0	18	11	5	B9536-	11	142	131	265	168	47	49	3	0	5			

New Jersey Table. A summary of six variety trials grown at three locations in New Jersey - 1983 - Continued

Air Pollution	Maturity	Color	Texture	Shape	Depth	Conformation	Eye Depth	Second Gr.	Growth Cr.	Heat Sprout	Hollow Heart	Heat Necrosis	Early Blight	Exp. No.	Seedling	Market Yield cwt	Total Yield cwt	Specific Gravity	% Culls	% under 1-7/8"	% 1-7/8-2-1/2"	% 2-1/2-3-1/4"	% over 3-1/4"	Field Rating	Chip Color
7 5	5	7 7 2 8 6	4 7 9 5	0 0 7	1	B9536-20	137 188 <sup>1/</sup>	145 204 <sup>1/</sup>	56 58 <sup>2/</sup>	16 52 30 3	5													5	
5 6	3	7 6 3 7 6	6 6 8 9	0 18	5	B9536-20	229 131	271 168	58 58	17 50 27 6	7													6	4354
7 5	4	8 7 2 5 5	7 9 9	0 0 7	1	B9536-23	180 188	192 204	54 58	20 58 20 2	7													5	
7 5	3	8 8 2 6 6	7 5 7 5	0 0 7	5	B9536-23	178 131	214 168	65 58	20 80	7													7	3236
4 6	4	8 7 2 5 7	6 9 9	0 0 7	5	B9536-33	227 188	269 204	61 58	18 46 30 03	6													5	
4 6	4	7 7 2 6 6	5 5 9 7	0 0 7	3	B9540-22	156 73	196 140	75 67	58 42	4													7	
4 4	4	5 5 4 6 7	8 7 9 5	0 0 7	6	B9540-24	169 128	213 159	71 67	23 53 15 05	4													6	
4 4	4	5 3 7 6 6	8 3 9 9	0 0 7	3	B9540-27	38 73	93 140	66 67	21 58 16 02	6													4	
5 7	5	5 4 8 4	8 3 9 9	0 0 7	6	B9540-29	102 128	139 159	63 58	14 56 28 3	8													8	2133
6 7	6	5 4 7 5 5	8 4 6 9	0 0 6	3	B9540-50	70 73	118 140	60 58	07 42 38 10	5													4	
2 4	5	5 2 7 4 3	7 5 6 5	0 18 7	3	B9540-51	67 73	132 140	61 67	10 37 39 10	7													8	
5	3	5 4 8 7 6	8 6 9 4	0 24 6	3	B9540-55	86 73	126 140	64 58	30 70	7													6	
3 5	2	5 3 7 6 7	8 9 9	0 18 5	1	B9540-62	124 128	160 159	73 63	24 59 14 3	4													5	
8 8	6	7 6 2 8 7	8 9 9	0 28	5	B9541-44	172 188	185 204	62 58	12 40 40 07	6													8	
6 6	3	6 7 4 5 6	9 7 9	0 26 0	6	B9541-44	197 131	228 168	65 67	36 64	5													7	
3 4	7	4 3 8 7 6	9 9 9	0 0 6	6	B9553-6	245 128	274 159	64 58	13 64 17	8													8	4344
7 4	8	7 6 3 7	7 8 9 8	0 0 0	1	B9569-2	227 128	265 159	80 63	24 59 14 3	4													8	6565
8 8	6	6 5 2 8 7	8 9 9	0 0 0	1	B9581-3	276 188	287 204	51 67	10 34 41 08	8													7	
3 5	3	5 4 8 6 7	7 8 9 8	0 0 0	6	B9581-10	174 152	200 167	80 63	24 59 14 3	4													8	4455
7 7	7	4 3 8 7 6	6 9 9	0 0 0	6	B9585-4	77 73	108 140	62 58	12 40 40 07	6													4	3656
3 5	3	5 4 8 7 6	6 9 4	0 0 0	1	B9596-2	137 128	164 159	63 58	36 64	5													6	
4 6	6	6 5 2 6 7	7 4 9 6	0 0 0	7	B9607-3	151 152	174 167	54 67	12 40 40 07	4													4	
8 8	8	8 7 2 7 7	6 9 4	0 0 0	1	B9638-11	218 188	249 204	51 67	36 64	5													4	
6	7	8 8 2 5 4	7 4 9 6	0 0 0	5	B9638-11	169 131	221 168	62 58	12 40 40 07	6													5	
7 7	7	4 3 8 7 7	6 9 6	0 0 0	6	B9648-9	153 128	176 159	63 58	36 64	5													3	
3 5	3	8 8 2 5	6 9 6	0 0 0	1	B9682-5	39 188	188 204	54 67	12 40 40 07	4													5	
4 6	4	5 3 8 5	3 9 5	0 0 0	7	B9689-7	113 188	169 204	51 67	36 64	5													3	
5 4	5	5 4 6 6 5	7 6 6 9	0 0 0	7	B9703-4	76 188	136 204	62 58	12 40 40 07	6													5	
						B9718-5	62 73	97 140	54 67	36 64	5													5	



New Jersey Table. A summary of six variety trials grown at three locations in New Jersey - 1983 - Continued

Air Pollution	Maturity	Color	Texture	Shape	Depth	Conformation	Eye Depth	Second Gr.	Growth Cr.	Heat Sprout	Hollow Heart	Heat Necrosis	Early Blight	Exp. No.	Seedling	Market Yield cwt	Total Yield cwt	Specific Gravity	% Culls	% under 1-7/8"	% 1-7/8-2-1/2"	% 2-1/2-3-1/4"	% over 3-1/4"	Field Rating	Chip Color
3 6	9	7 6 8	6 6	6 6	6 6	6 6	4 9 6	0 0	6 7	3 B9718-	7	86 73 <sup>1/</sup>	165 140 <sup>1/</sup>							50 50				7	
4 6	9	5 3 8	7 6	6 6	6 6	6 6	8 6 9 8	0 0	7 7	3 B9729-	6	64 73	96 140							33 67				7	
4 1	6	5 3 9	6 5	6 5	6 5	6 5	8 7 8 7	0 0	7 7	3 B9738-	2	33 73	69 140							52 48				5	
6 6	2	5 3 8	3	3	3	3	6 3 9	0 0	7 7	3 B9738-	5	58 73	85 140							32 68				3	
2 2	5	5 3 6	6 6	6 6	6 6	6 6	9 9 9	0 0	9 9	3 B9740-	4	72 73	119 140							39 61				6	
5 5	5	6 6 5	7 5	7 5	7 5	7 5	8 3 5 9	0 0	36 7	3 B9752-	3	91 73	132 140							31 69				6	
		5 3 7	7 6	7 6	7 6	7 6				6 B9752-	7	77 128	95 128							21 70	08 1			6	
		4 2 7	7 6	7 6	7 6	7 6				6 B9762-	1	71 128	93 128							24 68	07 0			5	
		5 3 8	7 4	7 4	7 4	7 4	3			6 B9762-	5	111 128	136 128							18 65	17 0			4	
5 4	4	8 8 2	6	6	6	6	1 9 4	0 0	17 7	1 B9770-	3	232 188	289 204							53 58				4	6666
4 5	6	8 9 9	5	5	5	5	3 9 9	0 0	7 7	1 B9775-	16	208 188	246 204											6	
6 4	6	7 7 2	7 7	7 7	7 7	7 7	5 6 5	0 0	7 7	1 B9786-	9	136 188	157 204											5	
6 6	7	8 7 2	5	5	5	5	5 9 6	0 0	9 9	1 B9786-	14	172 188	205 204											5	
7 6	7	7 6 3	6	6	6	6	6 9 9	0 0	18 9	1 B9786-	15	169 188	193 204											6	
7 6	6	7 7 3	5	5	5	5	5 9 5	0 0	9 9	1 B9786-	20	156 188	192 204											5	
6 7	6	8 7 2	6	6	6	6	6 9 5	0 0	9 9	1 B9792-	1	153 188	191 204											6	
6 7	5	7 6 2	5 6	5 6	5 6	5 6	8 5 9 6	0 0	7 7	2 B9792-	2	111 82	141 119							22 63	12 1			5	
5 5	5	8 7 3	5 6	5 6	5 6	5 6	7 9 9 9	0 0	27 7	2 B9792-	6	137 82	166 119							18 65	17 1			6	
5 4	8	7 7 2	7 6	7 6	7 6	7 6	8 5 6 9	0 0	3 3	1 B9792-	14	101 152	137 167							27 51	18 4			4	
7 5	7	7 7 2	6 6	6 6	6 6	6 6	7 9 9 9	0 0	7 7	1 B9792-	28	166 188	185 204							62 58				7	5466
5 7	5	7 6 2	8 6	8 6	8 6	8 6	6 9 9 9	0 0	5 5	1 B9792-	34	155 188	177 204							67 58				7	3343
5 7	5	7 6 2	8 6	8 6	8 6	8 6	8 4 9 9	0 0	7 7	1 B9792-	43	157 188	171 204											7	
5 7	6	7 6 2	5	5	5	5	5 9 6	0 0	7 7	1 B9792-	47	66 188	75 204											5	
6 5	4	8 7 6	4	4	4	4	6 9 6	0 0	7 7	1 B9792-	49	95 188	109 204											5	
4 5	2	8 8 2	4	4	4	4	5 9 8	0 0	7 7	1 B9792-	54	34 188	65 204											4	
2 5	2	7 7 1	7	7	7	7	7 9 9	0 0	9 9	1 B9792-	56	85 188	122 204											6	
2 5	6	7 5 2	8 7	8 7	8 7	8 7	6 9 9	0 0	9 9	1 B9792-	61	73 188	90 204											5	
6 6	6	8 8 2	6 6	6 6	6 6	6 6	6 9 9	0 0	7 7	1 B9792-	69	223 188	259 204							70 58				7	3334
6 4	4	8 7 2	5 6	5 6	5 6	5 6	7 9 9 9	0 0	5 5	1 B9792-	70	295 188	308 204							62 58				9	2234
4 3	3	8 8 2	5 7	5 7	5 7	5 7	6 9 9	0 0	7 7	1 B9792-	71	139 188	183 204											6	



New Jersey Table. A summary of six variety trials grown at three locations in New Jersey - 1983 - Continued

Air Pollution	Maturity	Color	Texture	Shape	Depth	Conformation	Eye Depth	Second Gr.	Growth Cr.	Heat Sprout	Hollow Heart	Heat Necrosis	Early Blight	Exp. No.	Seedling	Market Yield cwt	Total Yield cwt	Specific Gravity	% Culls	% under 1-7/8"	% 1-7/8-2-1/2"	% 2-1/2-3-1/4"	% over 3-1/4"	Field Rating	Chip Color
8 7	8 9	8 9	8 9	8 9	8 9	8 9	8 9	8 9	8 9	8 9	0	0	7	1	B9792-78	218 188 <sup>1/</sup>	266 204 <sup>1/</sup>	70 58 <sup>2/</sup>						7	3434
2 4	8 8	8 8	8 8	8 8	8 8	8 8	8 8	8 8	8 8	8 8	0	0	9	1	B9792-79	140 188	177 204							5	
8 7	8 7	8 7	8 7	8 7	8 7	8 7	8 7	8 7	8 7	8 7	0	0	9	1	B9792-84	248 188	303 204	70 58						7	3233
4 5	7 6	7 6	7 6	7 6	7 6	7 6	7 6	7 6	7 6	7 6	0	18	7	1	B9792-95	93 188	122 204							6	
5 4	8 7	8 7	8 7	8 7	8 7	8 7	8 7	8 7	8 7	8 7	0	0	9	1	B9792-97	102 188	138 204							6	
6 5	8 8	8 8	8 8	8 8	8 8	8 8	8 8	8 8	8 8	8 8	0	0	7	1	B9792-113	174 188	196 204	74 58						7	2334
5 5	8 8	8 8	8 8	8 8	8 8	8 8	8 8	8 8	8 8	8 8	0	17	9	1	B9792-119	131 188	140 204							7	
4 7	8 7	8 7	8 7	8 7	8 7	8 7	8 7	8 7	8 7	8 7	0	0	9	1	B9792-132	140 188	171 204							6	
4 5	8 7	8 7	8 7	8 7	8 7	8 7	8 7	8 7	8 7	8 7	0	0	7	1	B9792-136	196 188	227 204	61 58						7	3323
7 7	8 9	8 9	8 9	8 9	8 9	8 9	8 9	8 9	8 9	8 9	0	0	7	1	B9792-137	242 188	251 204	69 58						8	2322
6 7	8 9	8 9	8 9	8 9	8 9	8 9	8 9	8 9	8 9	8 9	0	0	7	1	B9792-144	203 188	227 204							6	
6 4	7 5	7 5	7 5	7 5	7 5	7 5	7 5	7 5	7 5	7 5	0	0	7	1	B9792-147	97 188	149 204							4	
5 7	8 8	8 8	8 8	8 8	8 8	8 8	8 8	8 8	8 8	8 8	0	18	9	1	B9792-157	70 188	80 204							6	
4 6	8 7	8 7	8 7	8 7	8 7	8 7	8 7	8 7	8 7	8 7	0	18	9	1	B9792-158	94 188	154 204							5	
3 5	8 8	8 8	8 8	8 8	8 8	8 8	8 8	8 8	8 8	8 8	0	0	9	1	B9792-159	70 188	120 204							5	
6 6	8 8	8 8	8 8	8 8	8 8	8 8	8 8	8 8	8 8	8 8	0	18	9	1	B9792-184	121 188	132 204	67 58						5	5555
4 3	7 8	7 8	7 8	7 8	7 8	7 8	7 8	7 8	7 8	7 8			9	1	B9792-185	188	204							3	
3 3	8 8	8 8	8 8	8 8	8 8	8 8	8 8	8 8	8 8	8 8			9	1	B9792-186	188	204							5	
7 6	8 8	8 8	8 8	8 8	8 8	8 8	8 8	8 8	8 8	8 8	0	0	9	1	B9792-8B	106 188	119 204							5	
6 4	8 6	8 6	8 6	8 6	8 6	8 6	8 6	8 6	8 6	8 6	0	18	9	1	B9792-11B	74 188	91 204							4	
3 4	8 8	8 8	8 8	8 8	8 8	8 8	8 8	8 8	8 8	8 8	0	0	7	1	B9792-13B	29 188	47 204							5	
3 3	8 8	8 8	8 8	8 8	8 8	8 8	8 8	8 8	8 8	8 8	0	0	7	1	B9792-16B	31 188	53 204							5	
4 3	8 8	8 8	8 8	8 8	8 8	8 8	8 8	8 8	8 8	8 8	0	0	7	1	B9792-17B	15 188	26 204							4	
4 6	8 8	8 8	8 8	8 8	8 8	8 8	8 8	8 8	8 8	8 8	0	0	9	1	B9792-27B	22 188	30 204							5	
5 5	8 8	8 8	8 8	8 8	8 8	8 8	8 8	8 8	8 8	8 8	0	0	7	1	B9792-30B	39 188	56 204							6	
6 7	7 7	7 7	7 7	7 7	7 7	7 7	7 7	7 7	7 7	7 7	0	0	5	1	B9793-13	97 188	133 204							4	
4 2	5 3	5 3	5 3	5 3	5 3	5 3	5 3	5 3	5 3	5 3	0	0	7	1	B9922-4	140 188	183 204	64 58						8	
5 5	4 2	4 2	4 2	4 2	4 2	4 2	4 2	4 2	4 2	4 2	0	0	7	1	B9922-9	14 188	107 204							5	
5 7	5 3	5 3	5 3	5 3	5 3	5 3	5 3	5 3	5 3	5 3	0	26	7	1	B9922-11	153 188	167 204							4	
2 6	5 4	5 4	5 4	5 4	5 4	5 4	5 4	5 4	5 4	5 4	0		7	1	B9922-13	188	204							4	

New Jersey Table. A summary of six variety trials grown at three locations in New Jersey - 1983 - Continued

Air Pollution	Maturity	Color	Texture	Shape	Depth	Conformation	Eye Depth	Second Gr.	Growth Cr.	Heart Sprout	Hollow Heart	Heat Necrosis	Early Blight	Exp. No.	Seedling	Market Yield cwt	Total Yield cwt	Specific Gravity	% Culls	% under 1-7/8"	% 1-7/8-2-1/2"	% 2-1/2-3-1/4"	% over 3-1/4"	Field Rating	Chip Color	
1	2	6	5	3			9	6	9	0	0	0	5	1	B9924-	188	204 <sup>1/</sup>							5		
2	2	5	4	5	6		9	9	5	17	15	3	3	1	B9924-	188	204							5		
6	4	5	3	4	5		3	9	5	0	0	0	5	1	B9924-	166	219	204						4		
2	5	6	5	9	4		6	9	5	0	0	0	7	1	B9924-	68	164	204						5		
4	7	5	4	6	5	6	6	9	6	0	0	0	7	1	B9924-	105	132	204						5		
2	6	5	4	5	7		6	9	4	0	0	0	7	1	B9924-	131	165	204						5		
6	8	6	5	4			4	9	5	0	0	0	7	1	B9924-	79	121	204						4		
6	5	5	3	5	7	7	9	9	9	0	18	9	9	1	B9925-	102	126	204						6		
3	2	6	8	7	5		9	9	9	0	0	0	7	1	B9925-	188	204							5		
1		5	3	8	7		9	9	9	0	0	0		1	B9925-	188	204							5		
2	2	5	4	6	4		9	9	9	0	0	0		1	B9926-	188	204							4		
3	5	5	4	7	5		9	9	9	0	0	0	9	1	B9926-	76	100	204						5		
2	5	6	5	7	5	6	8	9	9	0	0	0	7	1	B9926-	96	88	204						6		
6	6	7	7	5	5	7	9	9	9	17	14	7	7	1	B9926-	102	115	204						6		
5	6	5	4	8	4		9	9	9	0	0	0	7	1	B9926-	91	110	204						5		
1		5	2	7	7		9	9	9	0	0	0	7	1	B9926-	3	48	204						5		
4	4	5	3	7	6		4	9	7	0	27	7	7	1	B9926-	73	97	204						6		
3	2	5	3	6	7		9	9	9	0	0	0	7	1	B9926-	26	76	204						6		
1		5	5	6	5		8	9	9	0	0	0	7	1	B9926-	51	87	204						5		
5	6	6	7	7	4		9	7	9	0	0	0	7	1	B9926-	163	172	204						7		
1		5	4	8			9	9	9	0	0	0	7	1	B9926-	19	69	204						4		
2	5	5	4	7	6	7	9	9	9	0	0	0	9	1	B9926-	48	69	204						6		
2	2	6	7	5	4		9	9	9	0	0	0	7	1	B9926-	79	124	204						5		
4	4	7	7	5	5		6	9	8	0	0	0	7	1	B9926-	114	164	204						5		
6	8	8	8	5	5	7	8	7	9	0	18	8	8	4	AF236-	161	145	188	71	62 <sup>2/</sup>	15	62	23	0	7	
5	7	8	8	4	6	7	8	7	8	0	18	6	6	4	AF238-66	164	145	193	70	62	15	65	20	0	6	
6	7	7	6	3	7	7	9	9	8	17	18	7	7	4	AF330-	135	145	156	71	62	14	63	22	1	7	2432
4	4	8	8	2	4	6	8	7	9	27	0	8	8	4	B 5662WV13	120	145	132	58	62	9	68	22	1	5	
7	7	8	8	3	6	5	8	3	8	0	0	0	7	4	B 6949WV 3	127	145	160	54	62	21	55	24	0	5	
5	4	8	8	3	8	6	8	7	9	0	92	7	7	4	B 7019WV 1	132	145	153	65	62	13	69	17	0	5	

New Jersey Table. A summary of six variety trials grown at three locations in New Jersey - 1983 - Continued

Air Pollution	Maturity	Color	Texture	Shape	Depth	Conformation	Eye Depth	Second Gr.	Growth Cr.	Heat Sprout	Hollow Heart	Heat Necrosis	Early Blight	Exp. No.	Seedling	Market Yield cwt	Total Yield cwt	Specific Gravity	% Culls	% under 1-7/8"	% 1-7/8-2-1/2"	% 2-1/2-3-1/4"	% over 3-1/4"	Field Rating	Chip Color
4 5	8 8 4 6 5	8 1 7 5	0	28 7	4	CF72111-5	163 145	204 159	63 62	2	21 62 16	2	5												
7 3	8 7 2 6 6	8 6 9 9	0	0 6	4	CF74135-3	165 145	190 159	53 62	2	14 62 22	2	5												
5 6	8 8 3 5 6	7 4 9 6	0	37 7	4	CF75023-1	154 145	224 159	60 62	0	31 62 7	0	5												
5 8	8 7 5 4 5	9 4 9 7	0	0 7	4	CF75087-7	125 145	155 159	71 62	0	19 73 8	0	5												
3 1	7 7 3 4 6	8 9 9 9	0	28 5	4	CF77154-10	118 145	142 159	72 62	0	16 77 6	0	7												
6 6	8 7 4 8 8	8 6 9 7	0	18 7	4	CS74109-8	214 145	233 159	61 62	0	8 61 28	3	8												
3 3	8 7 3 6 7	6 6 9 9	0	0 3	4	G0712-1	145 145	170 159	62 62	0	15 57 28	0	6												
7 8	8 8 2 7 7	8 6 9 8	0	65 8	4	NY-59	133 145	145 159	60 62	0	9 65 25	2	7												
7 7	8 9 1 9 8	8 7 9 8	0	27 8	4	NY-63	165 145	180 159	60 62	0	9 57 33	1	9												
5 7	8 9 2 5 8	7 6 9 9	0	0 6	2	NY-64	225 82	266 119	66 68	0	15 71 13	0	9												
6 7	8 9 1 9 7	7 6 9 5	0	0 7	2	NY-67	127 82	159 119	63 68	0	19 68 9	0	6												
3 5	8 7 3 6 7	6 9 9 9	0	0 7	2	NY-69	90 82	179 119	62 68	0	53 45 2	0	7												
3 4	7 7 1 9 8	4 9 9 9	0	0 7	2	NY-71	123 82	144 119	68 68	0	15 71 13	0	8												
6 5	8 7 1 8 7	7 9 9 9	0	0 7	1	P0071-1	135 152	167 167	75 63	0	19 66 14	0	7												
5 5	7 8 2 7 7	8 9 9 9	0	84 5	1	P0081-1	126 152	174 167	72 63	0	33 60 7	0	6												
3 2	8 7 2 7 7	7 9 9 9	15 17 5	1	1	P0106-1	75 152	115 167	79 63	0	49 49 3	0	6												
6 5	5 5 2 7 7	7 8 9 9	17 26 5	1	1	P0125-10	139 152	182 167	69 63	3	28 54 15	0	8												
6 6	7 7 2 6 6	8 5 9 9	0 35 5	1	1	P0130-9	134 152	154 167	73 63	0	16 62 19	0	5												
2 3	8 8 2 7 6	9 9 7 9	0 18 7	1	1	P0130-13	64 152	129 167	65 63	10	41 42 7	0	6												
6 8	8 8 2	8 5 9 9	0 0 7	1	1	P0134-1	101 152	163 167	68 63	0	49 50 1	0	6												
2 3	8 8 2 8 7	6 9 9 9	0 0 7	1	1	P0154-2	136 152	171 167	68 63	0	21 69 9	0	8												
5 7	7 7 2 6 7	9 9 9 9	0 75 7	1	1	P0164-1	99 152	174 167	88 63	0	47 47 6	0	6												
5 5	7 7 1 7 7	8 9 9 9	0 28 7	1	1	P0164-4	118 152	144 167	73 63	0	20 71 9	0	6												
6 4	8 7 2 5 6	8 9 9 9	0 0 5	1	1	P0185-2	120 152	162 167	75 63	0	26 67 8	0	6												
	8 8 2 6 7			6	6	W 718	236 183	258 194	58 60	01	08 49 32	10	7												
5 5	7 6 2 6	9 9 9	0 37 9	1	1	WF31-4	137 188	160 204	72 58				6												
5 5	7 6 2 8 7	8 9 9 9	0 18 7	1	1	WF46-3	114 188	140 204	72 58				6												
5 5	7 7 1 8 7	9 9 9	0 66 7	1	1	WF46-4	139 188	156 204					7												
	5 4 8 6 7			6	6	ACADIA RUS	75 128	97 159	52 67				7												
7 7	6 5 2 8 7	7 9 9 9	0 94 5	1	1	ATLANTIC	151 152	195 167	80 63				7												

New Jersey Table. A summary of six variety trials grown at three locations in New Jersey - 1983 - Continued

Air Pollution	Maturity	Color	Texture	Shape	Depth	Conformation	Eye Depth	Second Gr.	Growth Cr.	Heat Sprout	Hollow Heart	Heat Necrosis	Early Blight	Exp. No.	Seedling	Market Yield cwt	Total Yield cwt	Specific Gravity	% Culls	% under 1-7/8"	% 1-7/8-2-1/2"	% 2-1/2-3-1/4"	% over 3-1/4"	Field Rating	Chip Color		
5 5	5		2	7			0	85	8	3	ATLANTIC	162	73 <sup>1/</sup>	193	140 <sup>1/</sup>	67	58 <sup>2/</sup>	16	84	18	51	27	4	7			
5	5	6	5	2	8	7	8	6	9	8	0	65	5	5	ATLANTIC	208	131	252	168	77	62	11	61	24	3	8	5345
6 8	6	7	6	2	7	7	7	6	9	8	0	94	5	4	ATLANTIC	214	145	241	159	59	58	20	46	30	5	7	4545
6 6	6	8	8	2	4		8	9	9	0	0	18	7	1	BELCHIP	209	188	217	204	56	58	7	34	45	14	6	3454
5	5	8	8	2	6	4	8	8	9	9	0	28	7	4	BELCHIP	179	131	222	168	59	62	48	52		6		
7 7	7	8	9	2	5	5	8	8	6	9	0	18	6	3	BELRUS	162	145	175	159	67	58	42	49	9	0	6	
5 4	2	5	3	8	4	5	7	8	9	9	0	0		6	BELRUS	73	73	140	140	67	67	19	50	26	04	8	
		4	2	8	5	6	8	8	9	9	0	0		4	BELRUS	128	128	160	159	67	62	18	72	9	1	6	
4 3	4	1	8	4	6	7	5	6	9	9	0	0	7	4	CARIBE	130	145	159	159	60	67	25	58	13	09	6	5365
4 5	5	5	4	7	6	6	9	8	9	9	0	18	6	3	CENTENNIAL	30	73	78	140	74	58	24	68	8	0	6	
5	4	2	7	6	7									6	CENTENNIAL	99	128	135	159	73	62	06	66	27	1	5	
6 7	6	8	7	3	5	6	9	9	9	0	0	0	7	1	CHIPBELLE	137	188	158	204	60	68	31	54	6		4	
4	4	7	8	4	6	6	8	8	9	9	0	0		5	CHIPBELLE	177	131	232	168	70	58	14	65	20	1	6	3333
7 7	7	8	7	4	5	6	7	8	9	9	0	0	8	4	CHIPBELLE	115	145	134	159	76	60	06	66	27	1	5	
		8	8	3	5	5	8	4	9	7	0	0	8	2	CHIPBELLE	191	183	205	194	68	68	10				4	
7 7	7	8	8	2	5	6	8	4	9	7	0	0		6	CRYSTAL	109	82	165	119	82	68	26	64	8		7	6445
4	4	9	8	3	5	5	9	6	9	7	0	18		5	CRYSTAL	136	131	217	168	79	62	14	63	21	2	8	4554
7 8	7	8	9	2	5	6	8	4	9	9	26	17	9	4	CRYSTAL	162	145	204	159	62	60	12	74	12	1	7	
		8	9	3	6	6								6	CRYSTAL	154	183	175	194	63	58	14	86			7	
7 6	7	8	8	2	7	7	8	5	9	6	0	0	6	2	DENALI	112	82	147	119	82	68	26	64	8		7	6445
7 7	7	8	8	2	7	7	8	6	8	9	0	0	7	4	DENALI	163	145	189	159	79	62	14	63	21	2	8	4554
		8	8	3	6	5								6	DENALI	134	183	150	194	79	60	12	68	19	1	5	
6 5	6	5	4	8	8	7	8	5	9	6	0	0	7	3	GOLDRUS	131	73	152	140	63	58	14	86			7	
1	1	6	5	7	8	6	7	7	8	9	0	0		5	GOLDRUS	77	131	105	168	26	61	12	2	6			
		5	3	7	7	7								6	GOLDRUS	174	128	204	159	68	67	14	54	27	04	7	3344
7 5	7	8	7	3	5	6	8	7	8	9	0	0	6	4	ISLANDER	138	145	175	159	67	62	21	62	16	1	6	
6 6	6	8	7	2	6	7	7	6	9	9	0	15	7	1	KATAHDIN	160	152	180	167	60	63	11	56	29		7	
7	7	9	8	2	7	6	8	7	9	8	0	27		5	KATAHDIN	181	131	226	168	44	58	20	48	24	7	7	
8 7	8	9	2	6	7		8	6	9	6	0	18	7	4	KATAHDIN	146	145	171	159	52	62	15	54	28	3	7	

New Jersey Table. A summary of six variety trials grown at three locations in New Jersey - 1983 - Continued

Air Pollution	Maturity	Color	Texture	Shape	Depth	Conformation	Eye Depth	Second Gr.	Growth Cr.	Heat Sprout	Hollow Heart	Heat Necrosis	Early Blight	Exp. No.	Seedling	Market Yield cwt	Total Yield cwt	Specific Gravity	% Culls	% under 1-7/8"	% 1-7/8-2-1/2"	% 2-1/2-3-1/4"	% over 3-1/4"	Field Rating	Chip Color
6 7	8 8	4 7	7 7	8 6	9 9	26	44	7	1	KENNEBEC	139	152 <sup>1/</sup>	181	167 <sup>1/</sup>	60	63 <sup>2/</sup>	0	24	49	19			6		
5 6	7 9	9 9	0	18	5	1	NORCHIP	232	188	265	204	73	58										6	3234	
2	7 8	2 7	5 5	8 6	9 7	0	37		5	NORCHIP	166	131	237	168	61	58			30	61	9	1	6		
7 6	8 8	2 7	6 6	7 6	9 9	0	38	7	4	NORCHIP	121	145	168	159	67	62			28	63	9	0	6	3242	
7 7	8 7	2 6	6 6	3 9	3	0	28	5	1	PUNGO	172	188	201	204									5		
8 8	7 6	2 6	5 5	7 2	9 2	0	18	8	4	PUNGO	130	145	155	159	68	62			16	42	37	4	5		
8 8	7 7	9 2	2 2	1 7	9	0	36	8	3	R BURBANK	69	73	128	140					48	52			1		
	5 4	9 8	4 4	3	8	0	0		6	R BURBANK	59	128	107	159	64	67	04		46	40	08	01	5		
D 1	2 8	3 7	7 7	9 8	9 9	0	0	7	4	RENSIN	97	145	127	159	59	62			25	68	7	0	7		
6 7	8 8	2 8	7 7	4 9	9 9	0	0	7	2	ROSA	121	82	179	119	65	68	0		36	57	7		6		
4	8 8	2 8	7 7	7 7	9 9	0	0		5	ROSA	188	131	249	168	58	58			25	60	14	1	7		
6 7	8 8	2 7	7 7	7 8	9 9	0	18	7	4	ROSA	149	145	189	159	64	62			22	64	14	0	6	2335	
	8 9	2 8	6 6						6	ROSA	113	183	135	194	62	60			17	74	09	0	5		
	5 3	4 6	6 6	5					6	RUSSETTE	153	128	183	159	68	67			14	61	20	02	6		
	8 9	6 6	6 6						6	SHEPODY	107	128	132	159	62	67		03	17	52	26	02	7		
7 3	8 8	2 6	7 7	7 9	9 9	16	18	7	1	SIMCOE	157	188	168	204	62	58		04	17	60	23	1	7	2365	
5	8 8	2 7	7 7	8 9	9 9	0	27		5	SIMCOE	173	131	208	168	61	58							8		
6 4	7 6	3 6	7 7	6 8	7 7	0	0	7	1	SUPERIOR	188	188	204	204									6	4564	
6 5	7 6	3 6	7 7	4 6	9 9	0	0	7	2	SUPERIOR	82	82	119	119	68	68	9		26	58	8		6	5456	
3	7 7	3 6	6 6	4 5	9 9	0	0		5	SUPERIOR	131	131	168	168	58	58			22	65	13	1	5		
5 4	7 6	3 7	7 7	4 5	9 6	0	0	7	4	SUPERIOR	145	145	159	159	62	62			9	66	24	1	6	6666	
	8 7	3 6	6 6						6	SUPERIOR	183	183	194	194	60	60			06	56	33	5	6		
6 5	7 8	3 6	7 7	8 6	8 9	0	56	8	4	Y CHIPPER	154	145	204	159	69	62			25	65	10	0	7	3232	
5 8	8 8	3 8	7 7	8 7	9 9	0	38	7	4	Y SUPREME	222	145	237	159	72	62			6	51	39	4	8	3655	
6 5	8 8	2 5	5 5	8 6	8 7	0	0	7	1	YUKON GOLD	244	188	268	204	64	58							7	5666	
6 5	8 8	2 6	7 7	8 6	9 8	0	47	8	4	YUKON GOLD	166	145	185	159	66	62			10	61	23	6	7		



J. B. Sieczka, R. C. Neese, D. D. Moyer and E. Pilimon

Results of Potato  
Variety Trials, 1983

General Information. Twenty-four named potato varieties and 60 numbered clones were evaluated in ten replicated experiments on Long Island. Eight of the experiments were conducted at the Long Island Horticultural Research Laboratory (LIHRL) in Riverhead, New York. The other two were evaluated in a commercial field on the South Fork of the Island. Other potato clone evaluations at the LIHRL included: two observational trials of primarily golden nematode resistant lines, studies on the effect of nitrogen rate on yield and quality of 11 GN resistant clones, and the effect of spacing and nitrogen rate on the performance of five russeted clones.

Early White - Chippewa, CF7523-1, NY63, NY69, U709-3, and U756-31 produced marketable yields greater than the standard variety 'Superior'. Internal necrosis and skinning were problems with 'Chippewa', CF7523-1 and NY63.

Main White - Clones which produced yields similar to 'Katahdin' include: 'Chipbelle', 'Islander', B7544-5, B9192-1, B9792-13, BR-7093-23, NY59, NY63 and NY 67. Clones which had appearance ratings similar to 'Katahdin' were 'Islander', 'Rosa', CF-7358-14 and NY63. Tubers of 'Belchip' were rough appearing and unsuitable for table stock. Internal defects plagued several varieties. 'Chipbelle' had a high percentage of tubers with hollow-heart and NY59 and CF-72107-15 were susceptible to internal necrosis when grown on Long Island.

Russet - The highest yielding russet line is 'Acadia' which produces oblong lightly netted tubers. Other clones which produce oblong tubers with a light netting are MN9319 and NY73; MN7973 did not russet under Long Island conditions. Hollow-heart was a problem in 'GoldRus', B9398-2, B9540-62 and B9767-9.

Nitrogen Rate on Eleven Varieties - The marketable yield of 'Chipbelle', 'Islander', NY67, U715-52 and U715-94 was not significantly affected by nitrogen rate ranging from 110 to 260 lb/A. The seedlings C7358-14 and NY63 responded to the first increment of nitrogen (160 lb/A) and then leveled off. The optimal rate of nitrogen for 'Wauseon' appears to be between 160 and 210 lb/A while the yield of C7523-1 appears to level off at 210 lb/A. The yield of 'Rosa' and 'Yankee Chipper' increased at a linear rate as nitrogen rates increased.

Nitrogen X Spacing - The difference between nine and twelve inch spacing did not materially affect yield of any of the clones tested. However, the percentage of tubers in the 10-16 ounce category tended to be greater for all clones except B9383-2 at the 12-inch spacing. The most apparent response to nitrogen was with 'GoldRus' and B9383-2.



Long Island Table 1. Results of Early White Potato Variety Trial, Riverhead, N.Y. 1983

1/ Clone	Yield (cwt/A)		% of Sup 1-7/8-4	% of Total		Int. Def. 3/			Spec. 4/ Grav.	Vine 5/ Mat	Tuber Data 6/			Comments 7/		
	Total	US No. 1 1-7/8-4		1-7/8-4	4	H.H.	Int. Nec.				Col.	Tex.	Shape		Depth	App.
							SI	M								
Campbell 13	308	287	79	93	1.0	-	-	-	73	4.3	W	RS	O-R	MT	6.8	Len, Sk
Chippewa	437	419	115	96	0.6	3	7	-	70	6.0	W	S	O	F	6.0	Sk, Irr
Superior	394	365	100	93	1.2	-	1	-	77	4.8	Bu	SN	R-O	MT	7.0	Irr
Yankee Chipper	361	315	86	86	0.4	-	-	1	83	7.5	Bu	RS	O-R	MT	7.0	
Yukon Gold	372	353	97	95	0.2	5	3	-	80	5.0	Y	RS	R	MT	6.5	P. buds, Sk
BS662-WV13	301	287	79	95	0.8	-	-	-	66	5.8	W	RS	R	MT	6.3	Sk
CF7523-1	459	415	114	90	1.8	-	6	2	1	8.3	W	S	R	MT	6.3	Sk, Irr
NY63	502	472	129	94	0.5	2	7	3	73	7.3	W	S	R	R	6.8	Sk
NY69	434	397	109	92	0.0	2	-	-	65	5.5	Bu	SN	R	R	7.0	P. buds, Sm
NY71	311	278	76	89	1.0	2	1	-	73	3.5	W	RS	R	MT	6.5	Sm, SI irr
U709-3	455	426	117	94	2.8(G)	6	3	-	71	2.3	BW	RS	R	MT	7.0	SE, SI irr
U756-31	513	486	133	133	0.2	-	1	1	78	5.0	W	RS	R	SF	7.3	Good Sk
Waller Duncan (.05)	(40)	(39)							(03)							

1/ Planted April 14, 1983, rotobeat August 15, 1983, harvested August 17, 1983. Within row spacing 9.3". Fertilizer applied at a rate of 1200 lb/A of 10-20-10-3 (MgO) in bands at time of planting, 50 lbs of N sidedressed. Plot size 2 rows x 12 feet, 4 replications.

2/ Defects = Total of all defects. Letters in parenthesis are abbreviations for major defects, S = sunburn, M = misshapen, G = growth cracks, L = prominent lenticels, Sc = scab.

3/ Number of tubers with hollow heart (including brown center) or internal necrosis of 40 tubers cut (10 per replication), SI = slight, M = moderate, S = severe.

4/ Specific gravity determined by hydrometer. 1.0 omitted.

5/ Vine maturity rated on August 6, 1983 on a scale of 1 to 9, 1 = completely dead, 9 = green and vigorous.

6/ Color - B = brown, BR = bright red, Bu = buff, BW = bright white, MR = medium red, P = pink, Pu = purple, W = white.

Texture - HR = heavy russet, MR = medium russet, RS = relatively smooth, SN = slightly smooth, S = smooth.

Shape - O = oblong, L = long, R = round.

Depth - F = flat, MT = medium thick, R = round, SF = slightly flattened.

Appearance - rated on a scale of 1 to 9; 1 = extremely rough, unattractive, 9 = smooth, attractive.

7/ Comment abbreviations. Irr = irregular, SI irr = slightly irregular, Sm = small, Sk = skinned, SE = shallow eyes, P = pink,

HS = heat sprouts, CT = chain tubers, DAE = deep apical eyes, MDAE = moderate deep apical eyes, Att = attractive, Len = prominent lenticels,

St = stolons, Kn = knobs, BS = black spot.

Long Island Table 2. Results of Advanced Golden Nematode Resistant Clones Experiment, Riverhead, N.Y., 1983

Clone 1/	Yield (cwt/A) Total 2-4"	% of Kat 2-4"	% of Total Yield				Int. Def. 3/			Spec. 4/ Grav.	Vine 5/ Mat	Tuber Data 6/				Comments 7/		
			2-2½	2½-3½	3½-4	>4	Def 2/	Int. Nec.										
								H.H.	SI			M S						
Belchip	438	333	75	22	53	2	1	14(G)	4	-	-	86	Bu	RS	0	F	4.5	Irr, DAE
Chipbelle	422	362	81	26	58	2	0	3(M)	19	-	-	100	Bu	SN	0	SF	6.3	Irr
Hudson	431	391	88	15	68	8	3	2	4	-	-	75	Bu	RS	R-O	MT	7.0	Len, Irr
Islander	485	433	97	29	60	0	0	1	7	-	-	86	Bu	N	O-R	MT	7.5	SI irr
Katahdin	494	446	100	19	70	2	1	3	0	10	7	72	W	RS	R-O	SF	7.0	MDAE, Sk, St
Rosa	362	285	64	44	34	0	0	2	3	-	-	78	W-P	RS	R	R	8.0	Sm, Sk
Wauseon	407	374	84	27	63	3	0	1	0	2	1	77	Bu	SN	R	MT	6.8	MDAE, SI irr
CF7358-14	406	363	81	30	59	1	1	1	2	2	-	79	Bu	SN	0	MT	7.8	
NY63	463	431	97	23	66	4	1	1	2	4	2	75	W	S	R	R	7.8	Nice, Len
NY64	425	351	79	38	45	0	0	2(G)	0	2	-	79	W	RS	R	MT	7.3	DAE
NY67	524	469	105	12	70	7	3	3(G)	0	3	1	71	W	RS	RS	MT	7.0	Sk, SI irr
NY72	431	398	89	18	71	3	0	2(M)	0	-	-	86	Bu	N	R	R	7.0	DAE, Irr
Waller Duncan (.05)	(50)	(48)										(05)						

1/ Planted April 14, 1983, vine killed September 1, 1983, harvested September 22, 1983. see footnote 1, Table 1.

2/ - 7/ See appropriate footnotes, Table 1.

5/ Rated August 30, 1983.

Long Island Table 3. Results of Main Season Variety Trial, Riverhead, N.Y., 1983

Clone 1/	Yield (cwt/A) Total	% of Kat 2-4"	% of Total Yield				Def 2/	Int. Def. 3/			Spec. 4/ Grav.	Vine 5/ Mat	Tuber Data 6/			Comments 7/					
			2-2½	2½-3½	3½-4	>4		H.H.	SI	M			S	Col.	Tex.		Shape	Depth	App.		
Katahdin	540	479	100	16	65	8	1	3(G)	0	8	8	3	68	4.8	W	RS	RS	R	SF	6.3	MDAE, SI irr
AF201-25	481	398	83	24	48	12	0	1	1	1	1	-	77	4.0	Bu	SN	0	MT	6.8	Irr	
AF236-1	447	418	87	14	53	21	2	4(S)	1	1	-	-	79	4.0	Bu	RS	0	MT	8.0	SE	
AF332-9	361	305	64	20	62	2	0	4(M)	0	-	-	-	73	1.0	Bu	RS	R	R	5.3	DAE! Irr	
B6949-WV3	477	405	85	16	59	10	2	5(S,M)	0	5	6	-	69	5.0	W	RS	RS	R-O	MT	6.8	Sk, Irr
BR7093-23	508	456	95	17	63	10	1	2	1	5	12	4	71	4.8	W	RS	RS	O-R	MT	7.3	MDAE
CF72107-15	345	281	59	22	54	6	1	9(G,M)	1	1	4	28	61	2.5	Bu	N	N	R-O	SF	5.8	Irr, CT, Sk
CF77154-10	295	192	40	41	19	0	0	4(M)	0	3	2	-	82	1.0	Bu	SN	R	R	8.0	Sm	
F73008	573	389	81	22	43	3	0	18(M)	0	2	1	-	67	5.5	Bu	RS	0	MT	4.3	CT, HS, Irr	
NY59	505	455	95	13	64	13	1	1	1	1	1	38	71	5.3	Bu	N	R	R	6.8	DAE, Irr	
NY63	441	390	81	14	59	16	3	1	1	5	4	2	68	2.3	W	RS	R	R	7.0	SI irr, MDAE	
NY67	503	450	94	11	65	13	3	2	0	4	-	-	71	4.0	W	RS	R-O	MT	7.0	Sk, SI irr, St	
Waller- Duncan (.05)	(58)	(56)											(03)								

1/ Harvested September 27, 1983, See footnote 1, Table 2.

2/ - 7/ See appropriate footnotes, Table 1.

5/ Rated August 30, 1983.

Long Island Table 4. Results of USDA Interregional Experiment, Riverhead, N.Y., 1983

Clone/ l/	Yield (cwt/A)		% of Kat 2-4"	% of Total Yield				Def-2/ 3 1/2-4 >4	Int. Def.-3/ Int. Nec.			Spec.-4/ Grav.	Vine-5/ Mat	Tuber Data-6/ Tuber Shape Depth			Comments-7/ App.		
	Total	2-4"		2-2 1/2	2 1/2-3 1/2	3 1/2-4	H.H.		SI	M	S			Col.	Tex.	R		F	
Belchip	417	340	82	23	56	3	2	8(G,M)	1	1	1	-	76	W	RS	O-R	F	5.3	Rg Irr, DAE
Chipbelle	431	371	90	31	53	2	-	1	9	1	-	-	92	Bu	SN	0	SF	6.3	Irr
Katahdin	481	413	100	13	58	14	2	4(S)	0	5	3	-	67	W	RS	R-0	SF	7.3	St
Superior	301	222	54	37	28	0	0	5(L)	0	1	-	-	68	Bu	SN	R-0	SF	6.0	DE, Irr
B8091-8	384	290	70	33	43	0	0	5(L)	0	1	-	-	76	Bu	SN	R	R	7.0	Lent
B8706-7	377	332	80	23	62	3	0	3(L)	2	3	3	2	74	Bu	N	R	R	6.7	
B9192-1	445	385	93	21	60	5	0	4(M)	1	2	1	-	78	Bu	SN	R	R	6.0	DAE
B9224-6	367	282	68	33	43	1	0	6(L)	0	-	-	-	76	Bu	SN	O-R	MT	7.0	
B9340-13	323	241	58	52	22	0	0	2(S)	0	-	-	-	78	W	RS	R-0	MT	7.3	
B9384-4	337	258	62	39	35	1	0	1	0	-	2	2	73	Bu	SN	R	R	7.3	Sm
B9792-13	457	390	94	34	50	1	0	2(G)	0	-	-	-	90	Bu	N	R-0	MT	7.7	SE
B9792-34	244	162	39	47	19	0	0	5(L,S)	0	-	-	1	81	W	S	O	SF	6.7	Sl irr
Waller Duncan (.05)	(75)	(72)											(03)						

1/ Planted April 14, 1983, vine killed September 1, 1983, harvested September 26, 1983. Plot size 1 row x 20', 3 replications. See footnote 1, Table 1.

2/ - 7/ See appropriate footnotes, Table 1.

3/ Thirty tubers cut per clone (10 per replication)

Long Island Table 5. Intermediate GN Resistant Lines - Cornell and USDA, Riverhead, N.Y., 1983

Clone 1/	Yield (cwt/A)		% of Kat 2-4"	% of Total Yield				Def 2/	Int. Def. 3/			Spec. 4/ Grav.	Vine 5/ Mat	Tuber Data 6/			Comments 7/			
	Total	2-4"		2-2 1/2	2 1/2-3 1/2	3 1/2-4	>4		H.H.	SI	M			S	Col.	Tex.		Shape	Depth	App.
Katahdin	502	422	100	17	55	12	2	5(S)	2	4	2	-	65	W	RS	R	SF	6.7	St, SI irr	
B7744-5	509	439	104	26	56	4	0	2(G)	0	-	1	-	67	T	SN	R	MT	5.7	DE, Irr	
B8687-13	358	286	68	29	51	0	0	3(S)	0	1	8	9	71	W	RS	R	MT	7.3		
B8706-15	328	281	67	32	54	0	0	1	1	-	1	-	86	Bu	SN	R	SF	6.3	DAE, Irr	
B8798-20	446	409	97	29	63	0	0	0	1	1	-	-	79	Bu	SN	R	MT	6.7	SI irr	
B9140-32	399	327	77	42	41	0	0	0	0	2	3	-	84	Bu	N	R	R	7.3		
U715-52	345	262	62	41	35	0	2	2(G)	0	2	1	-	71	W	SN	R	MT	7.3	SI irr	
U715-64	384	283	67	41	33	0	0	2(S)	0	-	-	-	83	Bu	SN	R	MT	7.0		
U715-94A	405	344	82	23	61	1	0	1	0	1	-	1	81	Bu	N	R	SF	6.7	MDAE	
U723-8	416	353	84	26	59	0	0	3(G)	0	-	-	-	68	Bu	SN	R	R	7.0	SI irr	
U729-21	451	331	78	43	30	0	0	1	0	1	-	-	70	Bu	SN	R	R	7.3	Sm	
U741-12	426	375	89	21	59	8	1	1	0	2	-	-	73	Bu	SN	R	SF	7.0	SI irr	
Waller Duncan (.05)	(NS)	(NS)											(04)							

1/ See footnote 1, Table 4.

2/ - 7/ See appropriate footnotes, Table 1.

3/ Thirty tubers cut per clone (10 per replication)

Long Island Table 6. USDA Russet experiment, Riverhead, N.Y., 1983

1/ Clone	Yield (cwt/A)		% of BelRus 4-16 oz	% of Total Yield				2/ Def			3/ Int. Def.			Spec. Grav.	4/ Vine Mat	5/ Tuber Data				7/ Comments
	Total	4-16 oz		<4	4-10	10-16	>16	H.H.	Int. Nec.		Col.	Tex.	Shape			Depth	App.			
									SI	M S										
BelRus	358	273	100	23	65	11	1	0	-	-	-	74	1.3	B	HR	L	SF	7.8		
Centennial R.	325	250	92	21	64	13	1	1	5	-	-	63	1.5	B	HR	O-L	SF	7.8		
GoldRus	351	254	93	24	62	10	0	4(M)	16	-	-	70	1.3	B	MR	L	R	8.0		
B9398-2	374	283	104	21	64	11	2	2	11	-	-	77	2.0	B	HR	O	SF	6.8	Sl irr	
B9399-1	348	249	91	23	61	11	0	6	0	1	1	63	1.3	B	MR	O-L	SF	6.8	Pear	
B9523-10	426	335	123	19	65	14	1	1	1	7	-	60	1.3	B	M-LR	L-O	MT	7.3		
B9540-9	414	287	105	29	60	9	1	1	0	2	6	74	1.3	W	RS	O	MT	5.3	DE, Irr	
B9540-62	382	314	115	16	58	24	1	1	14	-	-	69	1.5	B	HR	L-O	MT	7.3		
B9553-6	536	411	150	18	59	18	3	2	0	2	1	65	2.5	B	MR	O	MT	5.8	Pear	
B9569-2	408	302	111	20	61	13	1	5(M,G)	4	3	-	68	1.0	B	HR	O	R	7.0	Len	
B9596-2	508	439	161	11	68	19	1	1	0	4	9	66	2.3	B	MR	L	R	7.5		
B9648-9	418	317	116	13	53	23	3	8	1	3	6	<58	2.0	B	MR	L-O	R	7.0		
B9720-3	336	242	89	26	62	10	0	2(G)	0	-	2	72	1.0	B	HR	L-O	MT	6.8	Sl irr	
B9767-9	395	297	109	21	58	17	0	3(M)	21	1	2	60	1.5	B	HR	O	MT	6.8	Coarse sk	
Waller Duncan	(59)	(61)										(03)								

1/ Planted 4/29/83, vine killed 9/7/83, harvested 9/27/83. Plot size 1 row x 20 feet, 4 replications. See footnote 1, Table 1.

2/ - 7/ See appropriate footnotes, Table 1.

Long Island Table 7. Results of NE107 Russet Experiment, Riverhead, N.Y. 1983

Clone 1/	Yield (cwt/A)		% of BelRus 4-16 oz	% of Total Yield				Int. Def. 3/				Spec. 4/ Grav.	Vine 5/ Mat	Tuber Data 6/				Comments 7/		
	Total	4-16 oz		<4	4-10	10-16	>16	Def 2/	Int. Nec.					Col.	Tex.	Shape	Depth		App.	
									H.H.	Sl	M									S
Acadia R.	580	416	221	24	54	17	4	1	0	2	5	-	73	5.5	T	LR	O	SF	7.0	Len, Sl irr
BelRus	292	188	100	32	56	9	1	2	1	1	-	-	73	1.8	B	HR	L	SF	8.0	OK
Centennial R.	339	180	96	47	48	5	0	0	1	-	-	-	67	2.0	B	HR	O-R	SF	8.0	OK
Nobleless R.	446	240	128	30	42	12	0	16(M)	1	2	1	1	78	4.8	B	LR	L	R	4.8	Kn
R. Burbank	503	300	160	21	50	10	0	19(M)	5	1	-	-	77	5.0	B	LR	L	R	4.3	Irr
Russette	427	310	165	21	54	19	5	1	6	-	1	-	78	5.0	B	MR	O	SF	7.0	Sl irr
MN7973	436	321	170	25	57	16	1	1	0	1	-	-	65	2.3	Bu	SN	O	SF	7.5	Not Russet
MN9319	455	318	169	19	42	28	9	2(G)	0	-	1	-	70	2.8	T	LR	O	SF	7.8	
NY73	405	253	135	38	53	8	0	1	0	1	-	-	66	3.8	B	MR	O	MT	7.8	
Waller Duncan (.05)	(74)	(54)											(02)							
Not included in analysis of variance:																				
W718	568	429		14	52	24	9	1	10	1	2	-	67	4.0	W	S	R-O	SF	7.8	Att

Long Island Table 8. Results of NE107 Red Experiment, Riverhead, N.Y., 1983

1/ Clone	Yield (cwt/A)		% of Norland 2-4"	% of Total Yield				Int. Def. 3/			Spec. 4/ Grav.	Vine 5/ Mat.	Tuber Data 6/				Comments 7/			
	Total	2-4"		2-2½	2½-3½	3½-4	>4	Def 2/	H.H.	Int. Nec.			Col.	Tex.	Shape	Depth		App.		
										S									M	
Caribe	353	283	82	18	45	17	1	11(M)	0	1	-	70	1.3	Pu	RS	0	MT	6.8	MDE	
Chieftain	482	428	123	23	62	4	0	1	0	13	9	2	64	1.0	MR	RS	R-O	MT	7.5	OK
Norland	404	347	100	30	54	2	1	0	0	1	-	57	1.3	MR	RS	R-O	MT	7.8	Some HS	
Red Rosa	490	401	116	30	51	2	0	1	3	4	-	69	2.5	P	S	R	SF	6.8	Sk, Blotch, St	
Redsen	395	330	95	28	46	9	0	3(M)	1	2	-	64	2.8	BR	S	R	R	8.5	Nice	
Waller Duncan (.05)	(NS)	(NS)										(03)								

1/ Planted April 30, 1983, harvested September 29, 1983. See footnote 1, Table.

2/ - 7/ See appropriate footnotes, Table 1.

5/ Rated August 30, 1983.



Long Island Table 9. Results of South Fork White Variety Trial, Wainwright, N.Y., 1983

1/ Clone	Yield (cwt/A) Total	% of Kat 1-7/8-4	% of Total Yield		Def <sup>2/</sup>	Int. Def. <sup>3/</sup>			Tuber Data <sup>4/</sup>			Comments <sup>5/</sup>			
			1-7/8-4	> 4		H.H.	SI	M	S	Color	Tex.		Shape	Depth	App.
Chipbelle	311	275	108	88	1	4(S)	9*	-	-	Bu	N	O	SF	7.0	*Black discoloration
Hudson	313	253	100	81	1	8(M)	3	1	-	Bu	RS	R	SF	6.3	Irr
Islander	388	347	137	90	0	4(S)	0	2	-	Bu	SN	R-O	MT	7.0	Pear
Katahdin	294	254	100	87	1	4(S)	1	4	-	W	RS	R-O	SF	7.3	MDAE
Rosa	326	265	104	81	0	2	8	-	-	W-P	RS	R	SF	7.0	
Wauseon	290	266	105	92	0	1	1	2	-	Bu	SN	R-O	MT	7.0	MDAE
Yankee Chipper	335	275	108	82	0	5(S)	1	1	-	W	RS	O-R	SF	7.0	
C7358-14	320	283	111	89	0	1	0	-	-	Bu	N	R-O	SF	7.3	SI irr
CF7523-1	416	354	139	85	0	7(S)	1	4	3	BW	S	R	R	7.3	HS, MDE
NY63	348	306	121	88	0	5(S)	0	2	-	W	RS	R	R	7.0	Len
NY72	353	314	124	89	0	3(S)	0	-	-	Bu	N	R	MT	6.7	MDAE, Irr
Waller	(106)	(67)													
Duncan															
Not included in analysis of variance															
NY67	290	260	102	90	0	1	0	2/20	-	Bu	RS	R	MT	7.0	DAE, Len

Long Island Table 10. Results of South Fork Russet Trial, Wainwright, N.Y., 1983

1/ Clone	Yield (cwt/A) Total	% of BelRus 4-16 oz	% of Total Yield				Int. Def. <sup>3/</sup>			Tuber Data <sup>4/</sup>				Comments <sup>5/</sup>			
			<4	4-10	10-16	>16	Def <sup>2/</sup>	Int. Nec.			Color	Tex.	Shape		Depth	App.	
								H.H.	SI	M							S
Acadia R.	376	295	17	68	11	3	1	0	3	2	1	T	MR	O-R	SF	7.7	
BelRus	259	186	26	66	6	0	2	0	-	-	-	B	MR	L	SF	8.3	Nice
GoldRus	239	150	31	61	1	0	7(S)	3	-	-	-	T	LR	L-O	R	7.7	HS
NY73	298	227	18	66	10	3	3	0	-	-	-	T	N	O	MT	7.7	SI irr
Waller	(52)	(54)															
Duncan	(.05)																

<sup>1/</sup> Planted May 9, 1983, harvested October 16, 1983. Fertilizer applied at a rate of 2200 lb/A of 8-16-8-1.8 (Mg.), 3 replications. See footnote 1, Table 1.

<sup>2/</sup> - <sup>5/</sup> See appropriate footnotes, Table 1.

<sup>3/</sup> Thirty tubers cut per treatment (10 per replication).



Table 11. The effect on nitrogen rate on yield and quality of eleven golden nematode resistant potato clones, Riverhead, New York, 1983.

Clone <sup>1/</sup>	N Rate <sup>2/</sup> (lb/A)	Yield (cwt/A) Total	2-4"	% of Total Yield					Int. Def. <sup>3/</sup>				Spec. <sup>4/</sup> Grav.	App. <sup>5/</sup>
				<2	2-2½	2½-3½	3½-4	>4	H.H.	Int. Nec.				
										SI	M	S		
Chipbelle	110	393	346	13	30	53	4	0	12	2	1	0	90	7
	160	449	399	11	29	56	4	0	4	1	0	0	92	7
	210	450	386	14	28	53	5	0	3	2	0	0	90	7
	260	444	389	12	28	57	3	0	10	1	0	0	91	7
Waller-Duncan (.05)		(ns)	(ns)										(ns)	
Islander	110	377	309	18	38	43	1	0	10	0	0	0	78	7
(AF186-5)	160	456	386	16	36	47	1	0	5	2	0	0	77	7
	210	443	363	18	32	49	1	0	4	2	1	0	78	7
	260	474	389	18	34	46	2	0	10	0	0	0	78	7
Waller-Duncan (.05)		(81)	(ns)										(ns)	
Rosa	110	303	217	28	40	31	1	0	2	3	0	0	69	7
	160	350	253	28	44	27	1	0	1	3	0	0	70	7
	210	383	273	29	43	27	1	0	0	1	0	0	69	7
	260	412	312	24	43	32	1	0	0	1	0	0	70	7
Waller-Duncan (.05)		(46)	(55)										(ns)	
Wauseon	110	343	300	10	28	58	3	1	2	3	1	0	64	7
	160	410	369	10	29	56	5	0	2	2	1	0	69	7
	210	468	409	10	21	61	7	2	1	3	3	0	69	7
	260	446	391	11	21	60	7	1	3	4	1	0	68	7
Waller-Duncan (.05)		(65)	(63)										(ns)	
Yankee Chipper	110	340	246	28	40	31	1	0	2	0	0	0	78	8
(AF205-9)	160	380	276	27	42	30	1	0	1	0	0	0	80	8
	210	413	311	25	43	32	0	0	0	1	0	0	81	8
	260	450	330	27	38	35	0	0	0	0	0	0	81	8
Waller-Duncan (.05)		(37)	(31)										(ns)	
C7358-14	110	354	293	17	31	50	2	0	0	0	0	0	71	8
	160	424	365	14	35	48	3	0	0	3	0	0	71	8
	210	449	383	14	29	56	1	0	0	1	0	0	72	8
	260	466	388	17	30	52	2	0	0	1	0	0	70	8
Waller-Duncan (.05)		(50)	(43)										(ns)	
C7523-1	110	503	427	15	38	46	1	0	0	2	11	2	70	7
	160	544	480	12	32	54	2	0	0	4	5	3	69	7
	210	613	525	14	32	51	3	0	1	3	7	3	70	7
	260	619	544	12	30	54	4	0	0	3	2	1	70	7
Waller-Duncan (.05)		(43)	(48)										(ns)	
NY63	110	405	363	10	28	55	7	0	1	1	0	0	68	7.3
	160	453	416	8	19	56	17	0	4	2	1	1	69	6.5
	210	475	439	7	15	55	21	2	4	2	2	1	69	6.8
	260	483	439	8	17	57	16	2	2	0	5	1	69	6.8
Waller-Duncan (.05)		(47)	(52)										(ns)	
NY67	110	439	389	11	32	54	2	0	0	2	0	0	72	7
	160	474	426	10	26	59	4	1	1	3	2	0	73	7
	210	466	424	9	26	60	5	0	0	0	1	0	71	7
	260	459	396	14	26	57	3	0	1	5	0	0	72	7
Waller-Duncan (.05)		(ns)	(ns)										(ns)	
U715-52	110	292	215	26	41	33	0	0	1	0	0	0	70	8
(3 replications)	160	363	273	25	38	36	1	0	0	0	1	1	71	8
	210	368	289	22	40	38	0	0	0	2	1	0	70	8
	260	329	259	22	36	42	0	0	0	0	1	0	71	8
Waller-Duncan (.05)		(33)	(ns)										(ns)	
U715-94	110	435	398	9	17	68	6	0	0	2	0	0	76	6
	160	444	404	9	18	70	3	0	0	4	1	0	75	6
	210	479	436	9	19	69	3	0	0	6	0	0	74	6
	260	452	408	10	23	63	4	0	0	4	1	0	75	6
Waller-Duncan (.05)		(ns)	(ns)										(ns)	

1/ Planted April 27, 29, 30, 1983, C7358-14, CF7523-1, and U715-94 vine killed 9/16/83, all others 9/7, C7523-1 and NY63 harvested 10/16, all others 10/4. Within row spacing 9.3". Plot size 3 rows x 30', center row x 25' used for data for all clones except NY67, U715-52 and U715-94 which were one row plots bordered by other clones receiving same N rate. Experimental design: each clone analyzed as a randomized complete block with 4 replications except U715-52 which had 3 replications.

2/ All plots received 300 lb P<sub>2</sub>O<sub>5</sub>, 150 lb K<sub>2</sub>O and 50 lb MgO/A in bands at planting. All plots sidedressed with 50 lb N/A from ammonium nitrate on 6/7/83. The remainder on the nitrogen listed was applied at planting.

3/-5/ See appropriate footnotes, Table 1.

Long Island Table 12. The effect on nitrogen rate and spacing on yield and quality of five russet potato clones.

Clone <sup>1/</sup>	N Rate <sup>2/</sup> (1b/A)	Spac- ing (in.)	Yield (cwt/A)		Mean tuber weight (oz.)	% of Total Yield					Int. Def. <sup>3/</sup>				Spec <sup>4/</sup> Grav.	App <sup>5/</sup>
											Int. Nec.					
			Total	4-16 oz		<4	4-10	10-16	>16	Def	H.H.	S1	M	S		
Acadia Russet	110	9	434	357	6.2	10	69	13	4	4	0	3	5	0	67	7
		12	422	356	6.6	11	71	13	2	3	1	8	8	0	67	7
	160	9	402	355	5.8	9	73	11	2	5	1	5	3	0	69	7
		12	400	332	5.9	11	65	18	2	5	0	2	4	0	69	7
	210	9	477	393	6.2	10	72	10	3	5	0	5	2	0	69	7
		12	469	388	6.2	10	67	16	2	5	0	2	3	0	68	7
BelRus	110	9	254	219	4.8	11	78	8	0	3	1	0	0	0	72	8
		12	269	232	5.8	13	71	15	0	1	1	1	0	0	71	8
	160	9	316	269	5.3	14	78	8	0	0	1	0	0	0	69	8
		12	325	280	5.9	10	72	14	2	3	1	0	0	0	69	8
	210	9	310	253	5.1	17	69	13	1	1	2	2	0	0	68	8
		12	304	255	5.3	12	67	17	2	2	1	3	0	0	67	8
GoldRus	110	9	230	172	4.8	20	66	9	0	5	6	0	0	0	69	7
		12	212	172	5.1	15	70	11	0	4	5	0	0	0	69	7
	160	9	242	183	4.8	20	66	10	2	2	2	1	0	0	72	7
		12	263	204	5.3	15	66	14	0	5	4	0	0	0	70	7
	210	9	281	213	5.3	17	60	16	0	7	11	0	0	0	73	7
		12	266	201	5.3	17	60	16	0	7	7	0	0	0	71	7
NY73	110	9	360	308	5.1	14	75	10	1	0	0	0	0	0	60	8
		12	346	291	5.3	13	70	14	0	3	0	0	0	0	61	8
	160	9	336	286	5.3	13	75	9	0	3	0	0	0	0	61	8
		12	325	276	6.1	12	73	12	1	2	0	0	0	0	60	8
	210	9	351	301	5.6	11	74	12	1	2	1	0	0	0	60	8
		12	351	283	5.8	12	57	23	4	4	1	0	0	0	60	8
B9383-2	110	9	307	246	4.8	16	72	8	0	4 (M)	4	0	0	0	78	7
		12	314	251	5.4	16	68	12	1	3 (M)	5	0	0	0	78	7
	160	9	375	303	5.4	13	70	11	3	3 (M)	9	0	0	0	78	7
		12	346	292	5.4	12	75	10	1	2 (M)	8	0	0	0	77	7
	210	9	399	319	5.8	15	64	16	1	4 (M)	9	0	0	0	78	7
		12	355	286	5.8	14	69	11	1	4 (M)	8	0	1	0	78	7

1/ Planted 4/28-29/83; Acadia Russet vine killed 9/16/83, others 9/1/83; harvested 10/11/83. Each clone was planted as a separate experiment as a split plot with nitrogen rates as main plots and spacing as sub-plots. Four replicates were used for all clones except Acadia Russet which had 3. Plot size: 3 rows x 30' with the center row x 25' used for yield data for all clones except B9383-2 which was a 1 row plot bordered by other varieties receiving the same N rate.

2/ See footnote 2, Table 11.

3/ See appropriate footnotes, Table 1.

Long Island Table 13. Results of Observational Trials, Riverhead, N.Y., 1983

Clone <sup>1/</sup>	Total Yield cwt/A	Spec <sup>2/</sup> Grav.	Int Def. <sup>3/</sup>		Tuber Data					Comments
			H.H.	Int.	Color	Tex.	Shape	Depth	App.	
Conestoga	364	76	2	0	W	RS	R-O	SF	6.5	DE, Good Sk
Delta Gold	478	80	3	8	Y-W	RS	R	SF	6.0	Sk, Irr, Kn
GoldRus	327	79	6	0	B	MR	L-O	MT	8.0	
Katahdin	463	68	0	4	W	RS	R	MT	7.0	Sk
Katahdin <sup>A</sup>	451	68	0	2	W	RS	R	SF	6.0	Sk
Superior	331	69	0	0	Bu	SN	R	SF	6.0	Irr, MDE
Superior <sup>A</sup>	377	75	0	0	Bu	SN	O-R	SF	6.0	Irr, DE
B8687-31	456	76	4	8	W-Y	SN	R	R	7.5	Sm
B9164-1 <sup>A</sup>	431	84	8	0	B	MR	O	SF	7.0	Large
B9335-6	427	70	1	5	W	RS	O-R	MT	7.5	S1 Irr
B9336-27	331	85	0	4	Bu	SN	R-O	R	7.5	Sm
B9395-25	376	75	0	1	B	MR	O	SF	6.5	Sm
B9400-2	314	74	0	2	B	MR	O	MT	7.5	Sm
B9400-5	351	74	0	3	B	MR	O-L	SF	7.5	
B9530-6	367	75	0	0	Bu	SN	O-R	MT	7.0	DAE
B9539-14	394	71	0	0	B	H-MR	O-R	MT	6.5	S1 Irr, Blocky
B9541-14	332	82	4	0	Bu	SN	R	R	7.5	
B9541-20	389	78	0	2	W	SN	R-O	MT	7.0	Nice
B9541-43	326	72	2	0	B	N	R	R	7.0	Sm, DAE
B9545-40	341	67	0	0	B	MR	O-R	SF	5.5	
B9547-8	357	89	0	0	Bu	RS	R	R	8.0	Sm
B9562-17	484	72	2	6	B	MR	O-R	R	7.0	S1 Irr
B9563-2	467	74	0	0	B	HR	O	SF	7.0	
B9567-1	355	75	0	8	BW	S	R	MT	7.0	Sm, MDE
B9607-3	438	85	0	0	Bu	N	R	R	7.5	Sm
B9714-2 <sup>A</sup>	327	67	0	0	B	MR	O	MT	6.0	
B9729-6	342	75	0	0	B	MR	L-O	MT	8.0	Sm
B9775-27	422	66	0	16	B	MR	O-L	R	7.0	Kn
B9781-5	462	74	0	8	Bu	RS	R	MT	6.0	DE, Irr
B9786-15	378	74	0	2	Bu	RS	R-O	MT	7.5	Good set
B9786-20	409	78	0	0	W	RS	R-O	MT	6.5	
B9792-1	444	76	0	0	W	RS	R-O	MT	7.5	
B9792-49	428	81	2	4	Bu	SN	O-R	MT	6.5	Sk Irr

<sup>1/</sup> Planted 4/14/83, roto beat 8/29/83, harvested 9/1/83. Plot size 1 row x 15', 2 replications. See footnote 1, Table 1.

<sup>2/</sup> See footnote 4, Table 1.

<sup>3/</sup> Number of tubers with hollow heart or internal necrosis per 20 cwt (10 per replication).

<sup>A/</sup> Clones included in a non-replicated observation.

Long Island Table 14. Information on field rejected lines in observational trials, Riverhead, N.Y., 1983

Clone	Tuber Data				Comments	Clone	Tuber Data				Comments		
	Color	Tex.	Shape	Depth			App.	Color	Tex.	Shape		Depth	App.
B7805-1	W	S	R	MT	9.0	Int. nec.	B9541-21	W	SN	R	R	8.0	Sm
B8687-3	W-Y	S	R	MT	7.0	Irr	B9541-45	Bu	SN	R	R	7.0	DAE
B8687-8	W	SN	R-O	MT	7.0	Variable	B9555-13	W	RS	R-O	MT	7.5	Sm, P. Yield
B8687-10	W-Y	S	R	MT	8.0	CT	B9555-18	W	RS	R	R	7.0	Variable, CT, Kn
B8687-23	W-Y	SN	R-O	MT	7.0	HS, Sm	B9555-21	W	SN	O-R	R	6.5	Variable, CT, Kn
B8799-13	W	SN	R	R	7.0	Sm Pear	B9556-9	Bu	SN	R-O	R	7.0	Variable, CT, Kn
B9335-7	W	SN	R	R	7.0	Variable, P. Yield	B9597-10	BW	S	R	R	8.5	Sm
B9335-6	W	SN	O-R	R	7.0		B9612-7	W	RS	R-O	R	7.5	P. Yield
B9391-2	B	MR	R-O	R	7.0	Sm, P. Yield	B9653-1	Bu	N	R	R	7.0	P. Yield
B9419-6	B	MR	O	MT	6.5	Sm	B9708-1	B	MR	L	SF	5.0	Kn
B9423-4	Bu-Y	SN	R	MT	6.5	GC	B9714-1	T	MR	L	SF	5.5	Kn, Irr
B9514-47	W	S	R-O	MT	7.0	Sm, Irr	B9714-47	W	S	R-O	MT	7.0	Sm, Irr
B9518-3	W	RS	R-O	MT	7.0	P.Yield	B9729-2	B	MR	O-L	MT	7.0	Sm
B9523-15	B	MR	O	MT	5.0	Irr	B9733-20	B	MR	O	MT	6.5	
B9525-14	Bu	SN	R-O	R	6.5	Sm	B9338-2	B	MR	L-O	MT	6.0	Irr
B9527-1	W	RS	O	MT	6.0	P. buds, Irr	B9740-4	B	MR	O	MT	8.0	Sm
B9528-10	Bu	SN	O-R	R	6.0	Irr	B9744-1	B	MR	O	R	7.0	Sm, Kn
B9530-4	W	RS	R-O	MT	5.5		B9750-1	B	MR	O	R	6.0	GC, Irr
B9532-13	W	N	O	MT	7.0	Sm, P. Yield	B9762-11	T	MR	O-R	R	7.5	Sm
B9535-3	W	SN	R-O	MT	6.0	Irr, CT	B9767-20	B	MR	O-R	R	7.5	Sm
B9535-7	W	RS	R	R	7.0	Sm	B9769-18	W	SN	O-R	R	7.0	Sm
B9536-20	W	SN	R	MT	5.0	DE	B9775-15	Bu	SN	O-R	MT	3.5	Ugly
B9540-22	T	LR	O	ST	6.0	Irr	B9777-2	T	MR	O-R	R	7.0	GC, Sm
B9540-50	T	L-MR	O-L	MT	5.5	Kn	B9779-2	T	MR	L-O	SF	3.5	Ugly
B9540-53	T	L-MR	O-L	SF	5.0	GC, P. Yield	B9779-9	W	S	R	R	8.0	Sm, P. Yield
							B9792-9	W	RS	R	R	7.0	
							B9792-10	W	RS	R	MT	8.0	Sm

See footnotes in Table 1 for abbreviations, P. Yield = Poor yield.

D.E. Halseth and C.A. Maatta

Introduction

The Vegetable Crops Department conducted 12 replicated variety yield trials in eight counties in upstate New York in 1983 in which a total of 32 named varieties and 72 numbered clones were evaluated. Data from 10 replicated variety yield trials conducted in seven county locations is summarized in this report. Additional information on nitrogen by spacing, storage and chipping research can be obtained from the authors.

Upstate New  
York Trials

Research Farm. All 109 entries mentioned above, along with 60 Cornell (P1a1sted) and 72 USDA (Webb) observational clones, were evaluated at the Thompson Vegetable Research Farm at Freeville. These experiments (Tables 1-4) were planted at 9" spacing on a 34" bed with 1000 lbs/A of 15-15-15 on a Howard gravelly loam. See footnotes for dates of planting, vine kill and harvest. These trials were sprinkler irrigated.

Grower Trials. Replicated variety yield trials consisting of from eight to 14 lines were planted with growers in seven different counties (six locations are in this report, Tables 5-10). Two were russet trials (Tables 5 and 6) on mineral soils, two were for tablestock (Tables 7 and 8) grown on muck (peat) soils and two were for chipping (Tables 9 and 10) from mineral soils. Only the grower trial in Wyoming County (Table 10) was irrigated.

Seasonal Observations. In 1983 problems were primarily related to the hot, dry growing season. Specific gravity readings were higher than average, but not as high as 1982. Sunburn, bruising and soft rots were the major problems on white clones while misshapen, variable russet skin set and growth cracks were problems on russet varieties. Hollow heart was a problem on some clones.

Promising Clones. White numbered clones with golden nematode (GN) resistance that performed well were AT24-9, B8710-1, NY59 and NY72. GN resistant varieties which continued to yield competitively were Atlantic, Rosa and Islander. No GN resistant named russet variety is available at the present time, but B9540-62 and NY73 were two GN resistant russet clones which showed good potential in 1983.



Upstate New York Table 1. Variety Trial 1. Freeville, New York, 1983.

VARIETY OR CLONE 1/	YIELD (CWT/A)	US #1	% KAT	% OF TOTAL YIELD						INT 4/						
	TOTAL	1 1/2 - 4	YIELD	US #1 2/						DEF 3/	DEF 4/					
				A	B	C	D	E			H	V	N	SG 5/	APP 6/	VM 7/
SUPERIOR	372	352	126	2	8	51	35	0	3	5	0	0	76	6.0	5.3	
B8710-1	382	340	121	4	13	51	25	0	7	0	1	0	71	5.3	4.5	
B9224-6	340	312	111	3	10	46	35	1	4	0	0	0	76	6.0	5.5	
MONONA	327	312	111	2	9	50	36	1	1	10	0	0	71	5.6	5.8	
ATLANTIC	342	307	109	3	10	43	37	1	5	11	0	0	91	6.0	7.0	
B8687-13	329	304	108	4	14	50	28	3	1	5	0	1	77	7.4	5.5	
BELCHIP	336	300	107	3	7	44	38	4	5	23	0	0	83	4.6	7.8	
B9192-1	359	294	104	1	6	23	53	6	11	10	0	0	78	5.9	6.3	
B8706-7	332	292	104	2	18	37	33	1	9	22	0	0	76	6.3	7.3	
B9384-4	319	289	103	5	14	55	22	0	4	0	0	0	72	5.9	3.5	
KATAHDIN	337	281	100	2	7	42	35	3	11 (S)	11	0	0	77	5.9	7.0	
B9335-7	311	278	99	5	12	54	24	0	5	0	0	0	78	6.8	4.5	
CHIPBELLE	306	272	97	5	14	56	19	1	5	14	0	0	92	6.0	6.8	
B9140-32	286	268	96	3	17	59	18	0	3	1	0	0	86	6.5	5.3	
B9527-1	291	242	86	4	19	46	19	0	13	1	0	0	91	5.9	6.0	
B8091-8	297	241	86	6	12	34	35	2	11	19	0	0	76	6.1	5.5	
B9340-13	239	219	78	7	20	64	7	0	2	2	0	0	77	6.0	3.3	
B8706-15	219	205	73	5	22	63	9	0	2	6	0	0	87	6.3	3.3	
Waller-Duncan																
LSD (.05)	(54)	(54)												(5)		
C.V. %	12	13												5		

1/ Planted May 12, 1983, between row spacing 34", within row spacing 10", 1000 lbs/A of 15-15-15 applied in bands at time of planting, vines sprayed with 1.6 lb/A ametryn August 23 followed by 2.5 lb/A dinoseb Sept. 1, harvested Sept. 7.

2/ % of total yield of various size categories, Abbreviation: A=1 1/2-1 7/8", B=1 7/8-2 1/2", C=2 1/2-3 1/4", D=3 1/4-4", E=>4".

3/ DEF = Total of all defects combined. Defects >8% in parenthesis with the greater defect listed first. Abbreviations: G=growth cracks, I=extremely irregular shape, K=knobs from 2nd growth, S=sunburn.

4/ INT = number of tubers with internal defects of 40 tubers cut (10 per replication). Abbreviations: H=hollow heart, V=vascular discoloration, N=internal necrosis.

5/ SG = specific gravity determined by hydrometer with 1.0 omitted.

6/ APP = Appearance rating based on a scale of 1 to 9; 1=extremely rough and unattractive, 9=smooth and attractive.

7/ VM = vine maturity rated on a scale of 1 to 9, 1=completely dead, 9=green and vigorous. Rated on August 22.



Upstate New York Table 2. Variety Trial 2. Freeville, New York, 1983.

VARIETY OR CLONE 1/	YIELD (CWT/A) TOTAL	US#1 1 1/2-4	% KAT YIELD 1 1/2-4	% OF TOTAL YIELD					3/		INT 4/ DEF=			5/	6/	7/
				A	B	C	D	E	DEF=		H	V	N	SG	APP	VM
AF303-5	378	347	119	4	11	48	33	0	5		7	0	0	83	7.4	7.8
ROSA	393	335	115	9	23	45	18	0	6		17	0	0	77	6.4	6.0
CHIPPEWA	369	334	114	5	12	50	29	1	4		1	0	2	70	6.0	6.0
HUDSON	377	328	113	3	10	46	31	0	10		0	1	0	77	5.0	5.8
B6949-WVB	357	313	109	3	11	49	27	0	10		0	2	0	74	5.8	6.8
CF77154-10	352	311	109	5	16	55	17	0	7		1	0	0	82	6.6	2.0
ISLANDER	342	310	107	6	17	54	19	0	4		22	0	0	80	6.3	5.3
BELCHIP	384	307	107	2	8	37	34	2	16 (I)		20	0	0	83	4.0	7.3
BR7093-23	359	297	102	4	13	47	23	1	13 (S)		13	0	0	76	7.0	6.0
KATAHDIN	351	292	100	3	10	47	27	0	14 (S)		11	0	0	75	6.1	6.3
PENN71	353	289	99	3	9	47	26	0	15 (S)		10	1	0	77	5.3	5.3
MONONA	313	288	99	4	11	53	27	0	4		4	0	0	66	6.3	5.5
CRYSTAL	380	285	98	9	11	43	20	0	17 (S)		8	0	0	73	6.4	5.5
ATLANTIC	342	280	95	5	14	40	28	0	13 (S)		16	2	0	91	6.0	6.0
CF72107-15	318	274	94	3	13	45	27	0	10		8	1	0	74	6.9	4.0
KENNEBEC	378	272	93	4	13	38	21	0	24 (S)		2	0	1	77	6.1	6.0
SHEPODY	327	270	93	3	9	47	27	0	14		24	1	0	80	5.3	5.8
F7300-8	352	270	94	5	9	41	27	0	19 (G)		1	0	0	79	6.8	8.5
C7232-4	290	269	92	4	12	48	33	0	3		5	0	1	73	5.9	3.8
Y-CHIPPER	338	265	91	10	26	42	11	0	11		0	1	0	83	6.6	5.8
NORCHIP	333	263	90	6	16	46	16	0	16		1	0	0	81	6.4	6.0
ONAWAY	366	261	90	3	5	34	33	2	23 (S)		0	0	0	67	4.9	6.0
OCEANIA	297	257	88	4	14	46	27	1	8		1	1	0	66	6.4	2.8
B5662-WV13	290	254	88	3	11	44	33	0	10		6	0	0	74	5.9	5.8
AF332-9	292	247	84	5	16	52	16	0	10 (G)		0	0	0	73	5.3	3.5
WAUSEON	287	242	84	8	19	44	22	0	7		2	0	0	69	5.8	4.8
CHIPBELLE	295	240	82	6	15	48	18	0	13 (S)		27	0	2	91	5.0	6.5
CF74135-3	292	227	78	8	20	45	13	2	12		0	0	1	63	6.4	1.0
C-11	253	213	73	3	10	46	29	4	8		14	0	0	86	6.3	5.8
C-13	175	125	42	6	14	32	28	0	20 (S,G)		4	2	0	72	5.6	3.0
Waller-Duncan																
LSD (.05)	(49)	(53)												(5)		
C.F. %	11	14												5		
Other 8/																
AS201-10	277	245	84	7	24	51	14	0	5		0	0	0	66	6.5	1.0
AF201-25	425	341	117	3	9	53	19	0	8		3	0	1	84	6.3	6.3

1/ Planted May 11, 1983, vines sprayed with 1.6 lb/A ametryn Sept. 1 followed by 2.5 lb/A dinoseb Sept. 7, harvested Sept. 13. See footnote 1, Table 1.

2/-6/ See appropriate footnotes, Table 1.

7/ Vine maturity rated on August 30.

8/ Not included in analysis of variance. Thirty tubers examined for internal defects.

Upstate New York Table 3. Variety Trial 4. Early Vine Maturity Clones,  
Freeville, New York, 1983.

VARIETY OR CLONE 1/	YIELD(CWT/A)	US#1	%SUP YIELD	% OF TOTAL YIELD						INT DEF 4/						
				US#1 2/							3/					
	TOTAL	12-4	12-4	A	B	C	D	E	DEF		H	V	N	SG	APP	VM 7/
NY69	413	379	139	4	14	59	19	0	3	5	4	0	64	6.8	5.5	
NORLAND	352	303	113	5	16	58	11	0	9	0	0	2	64	6.1	2.0	
NY71	339	303	113	4	11	45	34	4	3	2	0	0	74	6.3	6.3	
A9-7	335	298	111	5	13	53	23	0	5	4	0	0	68	5.3	6.0	
AT48-21	320	290	108	6	14	49	28	3	1	0	1	0	69	6.4	5.0	
SUPERIOR	299	272	100	4	13	54	24	1	4	1	0	1	69	5.9	4.8	
REDSN	299	261	96	9	23	53	12	0	4	0	0	0	64	7.5	2.5	
AT53-35	260	223	84	9	20	51	15	0	6	3	0	0	76	6.8	5.3	
AF330-1	276	184	69	6	14	38	15	1	27	1	0	0	78	5.8	7.0	
Waller-Duncan																
LSD (.05)	(52)	(48)												(2)		
C.V. %	11	12												2		
Other 8/																
Simcoe	263	219	81	16	66	16	0	0	3	0	0	0	77	6.5	6.5	

1/ Planted May 10, 1983, vines sprayed with 2.5 lb/A dinoseb August 23,  
harvested September 1. See footnote 1, Table 1.

2/-6/ See appropriate footnotes Table 1.

7/ Vine maturity rated on August 22.

8/ Not included in analysis of variance. Twenty tubers examined for internal  
defects.

Upstate New York Table 4. Variety Trial 5. Russet Variety Trial, Freeville, New York, 1983.

VARIETY OR CLONE <sup>1/</sup>	YIELD(CWT/A) TOTAL	US#1 4-16oz	%RB YIELD 4-16oz	3 OF TOTAL YIELD							INT <sup>4/</sup> DEF <sup>3/</sup>						
				A	B	C	D	E	DEF		H	V	N	SG	5/ APP	6/ VM	7/ VM
ACADIA	343	316	114	2	10	35	47	1	4		9	0	0	76	5.6	8.0	
B9540-62	338	303	109	4	15	48	26	2	5		6	0	0	82	5.6	5.8	
B9596-2	349	294	106	3	6	32	45	4	9		1	0	0	72	5.9	5.8	
NORGOLD	340	293	105	5	14	46	27	1	8		17	0	0	71	6.0	5.3	
NY73	323	293	105	3	9	51	30	2	4		1	0	0	76	6.3	4.5	
RUSBURBANK	335	278	100	6	18	41	24	0	11		14	0	0	87	6.0	7.3	
B9523-10	317	277	100	4	12	40	35	2	7		2	0	0	65	6.3	4.5	
LEMHI	357	266	96	7	16	39	18	0	19 (G)		17	0	0	87	6.3	7.5	
B9395-25	296	243	87	4	10	35	37	1	12		1	0	0	76	5.9	4.8	
BELRUS	251	239	86	4	23	53	20	1	0		11	0	0	83	7.3	5.0	
B9391-2	260	236	85	5	17	45	28	1	3		7	0	0	76	6.8	4.5	
ALLAGASH	281	234	84	5	14	36	33	0	12 (G)		35	0	0	70	6.8	4.3	
B9398-2	275	230	83	5	13	42	29	1	11		18	0	0	85	6.3	4.5	
RUSSETTE	262	230	83	3	11	43	33	2	7		29	0	0	83	6.3	7.8	
B9569-2	212	178	64	6	15	43	26	2	8		2	0	2	72	6.5	4.5	
B9648-9	247	161	58	6	11	26	28	2	27 (G)		14	0	0	64	6.3	6.5	
GOLDRUS	205	148	53	10	18	37	17	1	17 (G)		18	0	0	79	6.1	3.8	
Waller-Duncan LSD (.05)	(31)	(42)												(6)			
C.V. %	8	13												5			
Other <sup>8/</sup>																	
B9553-6	309	171	62	8	4	22	29	2	35 (G)		3	0	0	69	5.7	5.3	

1/ See footnote 1, Table 1.

2/ Abbreviation: A = 0-2 oz, B = 2-4 oz, C = 4-10 oz, D = 10-16 oz,  
E = >16 oz.

3/-7/ See appropriate footnotes, Table 1.

8/ Not included in analysis of variance. Thirty tubers examined for  
internal defects.

Upstate New York Table 5. Franklin County Russet Trial, Malone, New York, 1983.

VARIETY OR CLONE 1/	YIELD(CH/1A)		%RB	% OF TOTAL YIELD					INT 4/		5/			6/
	TOTAL	US#1 4-16oz	YIELD 4-16oz	US#1 2/					DEF		SG			
				A	B	C	D	DEF 3/	H	V	I	SG	APP	
NY73	336	248	155	15	48	25	7	5		2	0	0	77	7.5
KATAHDIN	307	209	129	30	57	11	0	3		1	0	2	72	8.3
BELRUS	301	206	129	27	59	9	2	2		0	0	1	82	8.4
ACADIA	265	185	114	26	54	15	2	2		0	0	1	69	7.3
RUSBURBANK	307	163	100	34	51	2	0	13 (K)		0	0	4	77	5.0
NORGOLD	258	142	87	33	37	18	1	12 (K)		16	0	0	70	4.9
GOLDRUS	252	136	85	42	47	7	1	3		0	0	4	82	7.9
LEMHI	282	133	82	50	45	2	0	3		6	1	0	82	6.3
Waller-Duncan														
LSD (.05)	(33)	(30)												(2)
C.V. %	8	12												2

1/ Planted June 1, 1983, within row spacing 9", between row spacing 34",  
vine killed in early Sept., harvested Sept. 22.

2/ Abbreviations: A = 0-4 oz, B = 4-10 oz, C = 10-16 oz, D = >16 oz.

3/-6/ See appropriate footnotes in Table 1.

Upstate New York Table 6. Monroe County Russet Trial, Rochester, New York, 1983.

VARIETY OR CLONE 1/	YIELD(CH/1A)		%RB	% OF TOTAL YIELD					INT 4/		5/	
	US#1	YIELD	US#1 2/	3/				DEF				
	TOTAL	4-16oz	4-16oz	A	B	C	D	DEF	H	V	I	SG
KATAHDIN	509	394	452	12	51	26	0	10	11	3	0	78
NY73	364	261	309	20	55	17	1	7	4	4	0	73
ACADIA	365	239	258	17	49	15	4	15	7	0	1	79
LEMHI	428	223	281	14	38	14	3	31	29	0	2	79
NORGOLD	322	176	197	21	41	14	0	24	7	0	4	67
BELRUS	236	136	156	22	51	7	0	20	1	0	0	76
RUSBURBANK	336	94	100	13	28	1	0	58	4	0	0	84
GOLDRUS	167	82	105	31	43	5	0	21	2	0	1	74
Waller-Duncan												
LSD (.05)	(60)	(62)										(3)
C.V. %	13	23										3

1/ Planted May 27, 1983, within row spacing 9", between row spacing 34",  
vine killed in early Oct., harvested Oct. 18.

2/ Abbreviations: A = 0-4 oz, B = 4-10 oz, C = 10-16 oz, D = >16 oz.

3/-5/ See appropriate footnotes in Table 1.

Upstate New York Table 7. Orleans County Muck Variety Trial, Elba, New York, 1983.

VARIETY OR CLONE	YIELD TOTAL	CHITZAL US#1	%KAT YIELD	% OF TOTAL YIELD	INTERNAL DEFECTS	1/	2/	3/	4/	5/	6/
		2-4	2-4	0-2 2-4 4+	DEF	H	V	I	SG	APP	
KATAHDIN	349	255	100	5 73 0	21 (S)	0	11	0	69	7.3	
ATLANTIC	284	223	89	12 78 0	10 (S)	0	4	0	82	7.8	
NY59	330	221	86	9 67 0	25 (S,K)	0	2	0	73	7.4	
NY63	269	206	81	11 76 0	13 (S)	0	2	0	66	8.3	
ROSA	332	199	79	26 60 0	15 (S)	0	2	0	72	7.8	
NY67	173	128	51	9 74 0	17	1	4	1	64	7.5	
ISLANDER	199	126	50	25 63 0	12 (S,I)	0	11	0	76	7.4	
LEMHI	178	111	43	25 62 0	13 (S)	0	0	1	75	8.1	
CF7523-1	204	108	43	25 53 0	23 (S)	0	6	0	68	8.1	
YANKEECHIPPER	188	94	38	33 50 0	17 (S)	0	1	0	78	8.1	
NY73	179	93	36	27 52 0	22 (S)	0	8	0	71	7.6	
BR7093-23	119	76	31	11 62 0	26 (S)	0	2	0	68	7.9	
NY64	74	37	15	34 50 0	16 (S)	0	0	0	69	8.0	
GOLDRUS	82	15	6	46 18 0	36 (S)	0	0	0	75	6.3	
Waller-Duncan											
LSD (.05)	(37)	(31)							(2)		
C.V.%	14	18							2		

1/ Planted June 2, 1983, vines sprayed with dinoseb in early October, harvested October 19. Within row spacing 9", between row spacing 34". Some fall frost injury was found in many of the plots.

2/ % of total yield of various size categories expressed in inches.

3/-6/ See appropriate footnotes, Table 1.

Upstate New York Table 8. Wayne County Muck Variety Trial, Savannah, New York, 1983.

VARIETY	YIELD (GWI/A)			%KAT	% OF TOTAL YIELD				INTERNAL DEFECTS				
OR	US#1	YIELD			US#1				4/				
CLONE	1/	2/	3/	5/	6/								
	TOTAL	2-4	2-4	0-2	2-4	4+	DEF	H	V	I	SG	APP	
NY59	187	155	122	12	82	0	6	1	9	11	79	6.8	
NY67	180	139	112	19	77	0	4	1	0	0	74	6.4	
ISLANDER	183	137	106	22	74	0	3	7	0	0	77	6.6	
ATLANTIC	167	136	107	14	81	0	5	7	0	1	85	7.0	
KATAHDIN	170	130	100	14	76	0	10 (S)	0	0	0	71	6.5	
CF7523-1	177	126	98	19	71	0	10 (S)	0	0	1	70	7.0	
BR7093-23	165	126	101	17	75	0	8 (8)	0	0	1	73	7.9	
NY64	168	117	92	26	69	0	5	0	4	0	70	7.0	
NY63	165	114	91	20	68	0	12 (S,G)	1	0	0	71	7.6	
ROSA	171	106	85	33	61	0	5	0	2	0	77	6.8	
LEMHI	210	80	64	49	38	0	13 (I,G)	8	0	0	80	7.3	
YANKEECHIPPER	136	74	58	37	54	0	8 (S)	0	0	0	74	6.6	
NY73	132	58	43	54	42	0	4	0	0	0	70	6.5	
GOLDRUS	86	9	7	81	10	0	9 (S,K)	0	0	0	74	5.8	
Waller- Duncan													
LSD (.05)	(28)	(31)									(3)		
C. V. %	13	21									3		

1/ Planted May 11, 1983. Vines sprayed with dinoseb in early October, harvested October 12. Within row spacing 9", between row spacing 36".

2/ See footnote 2, Table 7.

3/-6/ See appropriate footnotes, Table 1.



Upstate New York Table 9. Steuben County Mineral Soil Variety Trial, Cohocton, New York, 1983.

VARIETY OR CLONE	YIELD (CHT/A) US#1	%KAT YIELD	% OF TOTAL YIELD				INTERNAL DEFECTS					
1/	2-4	2-4	0-2	2-4	4+	DEF	3/	4/	5/	6/		
	TOTAL							H	V	I	SG	APP
AT24-9	416	374	163	4	90	2	4	0	1	0	87	7.4
NY72	384	312	138	7	81	4	9 (S)	1	0	0	80	7.4
U729-21	382	309	134	14	81	2	3	0	1	0	79	7.6
ISLANDER	315	281	121	10	89	0	1	0	9	0	87	6.4
BR7093-23	322	276	119	9	86	0	5	0	0	0	86	7.4
ROSA	341	269	116	16	79	0	5	0	5	0	87	7.3
NY71	301	253	111	8	84	1	7	0	0	0	83	7.0
MONONA	300	248	109	13	82	2	3	2	11	0	79	7.3
U715-64	310	248	110	17	78	0	5	0	1	0	89	7.5
CHIPBELLE	292	245	106	11	84	0	5	0	7	0	93	5.5
ATLANTIC	286	240	105	9	84	2	5	3	0	0	93	6.9
KATAHDIN	276	234	100	8	85	1	6	0	1	0	82	6.9
BELCHIP	290	234	103	6	81	6	7	1	2	0	91	5.6
YANKEECHIPPER	287	221	97	20	77	0	4	0	2	0	93	7.6
Waller-Duncan												
LSD (.05)	(46)	(58)									(4)	
C. V. %	10	15									3	

1/ Planted May 28, 1983, vines sprayed with dinoseb in mid-September, harvested September 29. Within row spacing 9", between row spacing 36".

2/ See footnote 2, Table 7.

3/-6/ See appropriate footnotes, Table 1.

Upstate New York Table 10. Wyoming County Mineral Soil Variety Trial, Gainesville, New York, 1983.

VARIETY OR CLONE <sup>1/</sup>	YIELD (CHITZ) <sup>1/</sup>		% KAT YIELD	% OF TOTAL YIELD				INTERNAL DEFECS <sup>4/</sup>					
	TOTAL	US#1 2-4		0-2	2-4	4+	DEF <sup>3/</sup>		H	V	I	SG <sup>5/</sup>	APP <sup>6/</sup>
AT24-9	386	342	119	3	89	6	3	0	0	0	83	6.3	
NY72	367	316	111	7	87	2	5	0	1	0	78	6.3	
BR7093-23	350	309	108	5	88	0	6	4	0	0	77	6.6	
MONONA	338	309	108	3	91	3	3	9	3	3	70	5.6	
U729-21	340	297	104	11	87	0	2	0	1	0	74	6.4	
ATLANTIC	335	293	103	6	88	2	4	8	0	1	89	6.0	
ISLANDER	334	291	102	9	87	0	4	16	1	0	81	5.6	
NY71	329	288	101	5	88	3	4	2	8	0	80	5.8	
KATAHDIN	352	287	100	5	82	6	8 (S)	5	1	0	72	6.0	
YANKEECHIPPER	351	284	100	13	81	0	6	1	0	0	86	6.6	
ROSA	351	280	98	13	80	0	7	7	1	0	79	6.3	
U715-64	304	271	95	9	89	0	1	0	0	0	85	6.4	
CHIPBELLE	300	264	92	7	88	0	5	6	0	3	89	5.6	
BELCHIP	284	243	85	6	86	0	9 (I)	11	1	0	81	5.0	
Waller-Duncan													
LSD (.05)	(50)	(48)										(3)	
C. V. %	9	10										3	

<sup>1/</sup> Planted May 13, 1983, vines sprayed with dinoseb in early September, harvested September 19. Irrigation supplied throughout the growing season. Within row spacing 9", between row spacing 36".

<sup>2/</sup> See footnote 2, Table 7.

<sup>3/-6/</sup> See appropriate footnotes, Table 1.

R. L. Plaisted, H. D. Thurston, and B. B. Brodie

New York Breeding Program

This year the crossing program emphasized the development of round white chipping varieties and oblong russet varieties. A few new crosses were made crossing red skinned clones. All the crosses segregate for golden nematode resistance (GN) and all have at least one scab resistant parent. The chipping parents were chosen that would yield selections with good specific gravity and ability to recondition from 45° storage. Monona was a frequent parent in the chipping crosses and Bake King in the russet crosses. Three neotuberosum clones with good chip color and resistance to PVY and late blight were also used as males for several nematode resistant tuberosum females. A half million seeds were produced.

This year we experimented with direct seeding the true seeds into the "Speedling" trays. We purchased a modified seeder of the type used by bedding plant operations. The objective was to reduce the expense and management difficulty of transplanting. We discovered that treating the seeds with gibberellic acid would improve the uniformity of germination, that the newly seeded trays could be held in stacks to maintain moisture until the seedlings started to emerge, and that at least a week in the greenhouse was needed to insure adequate temperature for good emergence and early growth. The yield of tubers from the direct seeded trays did not equal the transplants, so we need to learn more about the system in order to capitalize on its efficiencies. We also learned that after mid-June we can place the transplanted trays directly in the field, thus saving the problem of transportation and double handling. Earlier failures at this apparently were due to the cold temperatures in early June.

Over 90,000 seedlings were seeded or transplanted. At harvest time, the non-russeted tubers in the russet-type crosses were discarded. The yield was 36,642 russets and 31,066 others. The others are mostly round whites with chipping potential and 7 families of red skinned tubers.

Over 80,000 seedling hills were planted at Willsboro, New York, and Mt. Pleasant at Ithaca. In spite of the dry season, growth was good and 13,736 selections were made. Of these, 2,678 are from one cross: Rosa x Q155-3. This should combine GN resistance, chip color, and resistance to scab, early blight, late blight, and leaf roll. Another large progeny was NY67 x NY66 which combines GN and scab resistance from both parents, earliness and attractive appearance. Andigena parents chosen for chip color and resistance to late blight and PVY were crossed to GN-resistant tuberosum clones and produced 1,796 selections.

The 25,000 first year selection (D's) from 1982 were planted as single hills with 4 cut size tubers. We selected 2,454 of these hills which will be screened this winter for resistance to the GN. We expect 1,508 of them to be resistant. There are 84 red clones. The rest are round whites, with a strong emphasis on chip color. The largest family is Chipbelle x Q155-3. Others are Rosa x Q155-3, NY70 x Hudson, Rosa x NY66, NY59 x NY66, Q155-3 x NY66, and Q55-7 x Adg with scab resistance. These constitute about one third the total. Seven selections were saved from 59 hills of 3 families from Scotland that combine H<sub>1</sub> resistance with G. pallida resistance.

The third-year observation plots contained 178 clones (C's), of which 40 were selected. All are resistant to GN and about half are potential chipping varieties. Atlantic is the parent of 15 of the 40.

From the 57 clones in the first year yield trials (B's), 13 have been selected. Nine of these are tub x adg hybrids which will combine resistance to GN with resistance to scab, PVY, late blight, and wart. Six of the 13 are good chippers.

The second-year yield trials (A's) contained 29 clones from which 7 were saved. All are GN resistant round white varieties. Three will chip, 6 are early, 2 are resistant to Verticillium wilt, and all are more resistant to scab than Katahdin and 2 are equal to Superior.

The more advanced yield trials contained 16 clones, all resistant to GN. Line U715-64 has excellent chip color, appearance, and high solids but does not yield as well as Katahdin. Line U715-94A yields well, is attractive, has high solids, and is scab resistant. It has marginal chipping ability. Line U729-21 is another chipper with acceptable yields, attractive shape, and earliness. It has low gravity and is similar to Katahdin for scab susceptibility. Line U756-31 has good yields of attractive tubers, good scab resistance and long dormancy. After cooking darkening may be a problem.

Line NY59 is a high yielding clone that does very well on the muck. Line NY63 is an attractive clone that seems especially adapted to Long Island. Lines NY64 and NY67 are table stock varieties whose niches are not well identified yet. Line NY69 is an extremely attractive clone that may fit the need for an early, if small tuber size does not make it unsatisfactory. Line NY71 looks promising as a chipper. NY72 could be either a chipper or tablestock. Line NY73 is an oblong russet. The other attributes of these clones are summarized in Table 1.

The "U" clones were presented to the Uihlein Farm in the form of virus-tested plantlets in tubes. This was the first occasion of this form of introduction and proved to be very satisfactory.

Seven NY clones and 8 "U" clones were increased at Canton and Mt. Pleasant. Approximately 40 bushels of seed were produced of each of the 15. A new storage was built to store them. In 1983, 15 acres were certified. This should become closer to 100 in 1984.

Seed of NY59 was produced by one foundation seed grower and 10 acres produced by one muck farmer at Elba. Lines NY63, NY64, and NY67 were produced by several Foundation seed growers and demonstrations grown on Long Island. One certified seed grower produced 0.6 acres of NY73 under contract. Seed of all these will be available for demonstration trials in 1984. Line NY71 and 2 "U" clones were grown by a Steuben County chip producer and will be processed at Wise.

The performance of the most advanced clones is summarized in Table 1 and of clones with two years of yield tests in Table 2.

New York Breeding Table 1. Summary of Advanced Clones.

	<u>GN</u>	<u>Yield</u> <sup>1</sup>	<u>Appear.</u> <sup>1</sup>	<u>SG</u> <sup>1</sup>	<u>Chip</u> <sup>2</sup>	<u>ACD</u> <sup>3</sup>	<u>Dorm.</u> <sup>1</sup>	<u>Scab</u> <sup>4</sup>	<u>VW</u> <sup>4</sup>	<u>LB</u> <sup>4</sup>	<u>Mat.</u> <sup>5</sup>
NY59	R	+	=	++	No	VG	+	R	VR	VR	VL
NY63	R	+	+	=	No	=	+	S	R	S	L
NY64	R	=	=	=	No	VG	=	R	S	S	L
NY67	R	=	=	=	No	G	+	S	VR	S	VL
NY69	R	=	++	-	No	VG	+	R	S	S	M
NY71	R	-	=	=	50°	=	+	OK	S	R	E
NY72	R	+	+	+	50°	P	++	VR	R	R	VL
NY73	R	-	+	=	50°	G	=	R	S	S	M
U715-64	R	-	=	+	45°	G	=	OK	S	S	E
U715-94A	R	=	+	+	50°	=	=	R	S	S	L
U729-21	R	=	+	-	45°	=	=	VS	VS	S	VE
U756-31	R	=	+	=	No	P	++	R	S	S	M

<sup>1</sup>Relative to Katahdin, + (greater than), = (same), - (less than)

<sup>2</sup>Storage temperature that produces acceptable color \*

<sup>3</sup>Very good, good, acceptable, poor

<sup>4</sup>Resistant, intermediate, susceptible

<sup>5</sup>Very late, late, midseason, early, very early



New York Breeding Table 2. Clones introduced to Uihlein Farm 1984.

	<u>GN</u>	<u>Yield</u>	<u>Appear.</u>	<u>SG</u>	<u>Chip</u>	<u>ACD</u>	<u>Dorm.</u>	<u>Scab</u>	<u>VW</u>	<u>LB</u>	<u>Mat.</u>
A3-5	R	-	=	++	45°	Q	=	R	R	S	L
A9-38	R	=	+	=	No	A	-2	OK	R	S	M
A73-1	R	=	+	--	No	A	=	VR	S	S	VE
A73-26	R	=	++	--	NO	A	=	OK	S	S	E
A85-8	R	=	+	=	NO	G	+2	R	S	S	M
AT24-9	R	++	+	++	50°	A	+2	R	OK	R <sup>-</sup>	L
AT48-21	R	-	=	-	45°	A	=	VR	S	R <sup>-</sup>	VE

Small size  
Adapted to LI  
Small size

R. H. Johansen, B. Farnsworth, D. Hahn, G. Secor and P. Nolte

Potato Breeding  
Program

Crossing and Seedling Production. In 1983, 115 potato crosses were made in the greenhouse during February, March and April. Breeding procedures emphasized good processing qualities, high solids, good red skin color, russeting, yield and good horticultural qualities. From crosses made this year and in previous years, approximately 43,000 seedling tubers were produced in the greenhouse during the summer and fall of 1983. These tubers will be planted at Langdon in 1984.

Approximately 48,000 seedling tubers were planted in the field at Langdon Experiment Station. The seedlings were planted on May 10 and 11 and harvested on September 12, 13 and 14. Of these seedlings, 1,019 were selected at harvest for further study and evaluation.

Advanced Selections. In 1983, 1036 second-year selections were planted in adaptation plots at Grand Forks and seed maintenance plots at Absaraka. These selections were planted at Grand Forks on May 18 and harvested on September 6 and 7. Selections were also planted at Absaraka on May 17 and harvested on September 19. The Department of Plant Pathology was responsible for the Absaraka plot. From these second year selections, 210 were saved for further increase and evaluation. In similar plantings at the two locations and Casselton, 147 third-year selections were planted with 45 saved at harvest. In the fourth-year category, 93 selections were planted with 71 being saved at harvest time. In addition, named cultivars and advanced selections from other states and second-year selections from the Idaho and Texas potato breeding programs were planted at Grand Forks and Casselton. An increase and adaptation plot was also planted again at Barnesville, Minnesota but was lost due to heavy rains and severe flooding.

Promising Selections. In early March, ND146-4R was named Redsen. Several hundred acres of this cultivar were planted in the Red River Valley in 1983 for utilization as fresh and certified seed. This cultivar appears to have promise as a fresh wash table cultivar; however, it does continue to have problems with pressure bruising and Fusarium dry rot. To avoid a poor stand due to seed-piece decay it is recommended that Redsen be planted quite shallowly.

The two russet selections, ND388-1Russ and ND534-4Russ, continue to look good as future russet cultivars. Several acres of both of these selections were planted in 1983 and it is anticipated that a fairly large acreage will be planted of both in North Dakota and Minnesota during 1984. Both selections have a beautiful russet skin and both have Nooksack and Norgold in their

parentage; ND388-1Russ has Nooksack as the female parent. The selection ND388-1Russ is an oblong, blocky russet and seems to be very well adapted to the Northwestern United States, particularly Oregon.

Other selections showing promise are the white-skinned chipping selections ND860-2, ND678-8, ND398-1, ND651-9, TND22-2 and ND55-7. Several of these selections chip fairly light in color out of 38° F storage. Probably the most outstanding of these are ND860-2, ND651-9 and ND678-8. A fairly large increase of these selections were harvested by the foundation seed growers at Beach, North Dakota and it is anticipated that a large increase will be replanted in 1984. Several of these white-skinned chipping selections were planted in November at Homestead, Florida in an observation trial and will be harvested in late January or early February of 1984.

Some other selections that appear promising in the program are ND967-1Russ, ND649-4R, ND944-6, ND1215-1, ND1118-1 and T7-294-1Russ. All of these selections were grown in trial at Grand Forks in 1983.

Cultivar and Selection Trials. In the cultivar and selection trials there were 25 hills grown in four replicated blocks at Grand Forks, Park River, Minot and Williston. For general maintenance of the trials, Wayne Grinde was in charge of the Park River trial and Dennis Askim was in charge of the Grand Forks trial. Branch Station Superintendents, Ernie French and Ben Hoag were in charge of the Williston and Minot trials, respectively (North Dakota Table 1). At Grand Forks and Park River, 25 entries were entered in trial, while at Minot and Williston, 12 entries were grown in trial.

In addition to the statewide trial, 30 advanced selections consisting of 20 hills were grown in two replicated blocks at Grand Forks. The North Central Regional trial was also grown at Grand Forks and will be summarized in another report.

The 1983 growing season was hot during July and August. On several days, record or near record temperatures over 100° F were recorded. At Grand Forks, the following rainfall was recorded: May 10-31, 1.43"; June, 4.75"; July, .75"; August, 3.08"; and September 1-16, 1.03". Park River probably was a little drier than Grand Forks, however rainfall did occur at a critical time to produce somewhat higher yield at Park River. At Minot, rainfall during the growing season was below or near average, however much precipitation in the form of snow or rain fell from the fall of 1982 until planting time. Temperatures at Minot were also above normal during July and August along with high humidity. At Williston, rainfall was below normal (7.20" from April through September) and August temperatures were above normal (23 days with 90° F or above).

The average yield at Park River was slightly above that of Grand Forks (North Dakota Table 2). The average yield of all entries grown at Park River was 214 cwt per acre compared to Grand Forks with an average yield of 182 cwt per acre. In western North Dakota, Minot had an average U.S. No. 1 yield of 112 cwt per acre compared to Williston which had a 63 cwt per acre average. High temperatures during July and August drastically reduced yields in western North Dakota (North Dakota Table 3).

The highest yielding entries in the Red River Valley trial were Red Pontiac, ND258-1, ND651-9, ND55-7, Crystal, ND678-8 and Kennebec. Russet Burbank with an average U.S. No. 1 yield of 75 cwt per acre was the lowest yielding entry in the Red River Valley and western trials. Yields were higher in selections ND388-1Russ and ND534-4Russ than the russet check cultivars, Norgold Russet, Russet Burbank and Lemhi. Two promising chip selections, ND651-9 and ND678-8, outyielded both Kennebec and Norchip, while ND860-2 yielded comparable to Norchip. In western North Dakota, Norchip was the highest yielding entry. Its early maturity and high set was probably responsible for its high yield.

In the Red River Valley trials, ND258-1, Crystal, TND22-2, Norchip, ND860-2 and Lemhi produced the highest total solids (above 19.9). Total solids averaged 19.2 percent at Park River and 18.3 percent at Grand Forks. Compared to results from past years, this is quite low. Red Pontiac and ND392-4Russ with 16.8 percent solids were the lowest entries in trial. In the advanced selection trial at Grand Forks, ND649-4R, ND944-6, ND1215-1, ND1118-1 and T7-294-1Russ produced quite high yields. These selections have good horticultural characteristics and several have good chip quality (North Dakota Table 4). The lowest yielding entry in this trial was RB 5788 with an average U.S. No. 1 yield of 55 cwt per acre.

Processing Tests - Chipping. Chip tests from selections and cultivars grown in the 1982 potato cultivar trials are reported in North Dakota Table 5. Potato samples were stored for several weeks at 38° F and then chipped at that temperature. The samples were then stored at 65° F and chipped every two weeks. After four weeks in storage, very little difference was found between the two locations. Fairly light chips were produced by ND860-2 and ND698-1 out of 38° F storage and these two selections can be considered as cold chippers. Most of these selections along with several others produced excellent chips after four weeks or reconditioning at 65° F (North Dakota Table 5). Again, several of these outstanding chipping selections are being increased by foundation seed growers and are being considered as potential new cultivar releases.

In 1982-83, 145 second-year selections were tested for chip quality, including blistering, by the Processing Laboratory. These selections were placed in cold storage after harvest and then reconditioned at 65° F before being chipped. Of these



selections four had Agtron readings of 45 or above. The third and fourth-year selections were chipped out at 43° F and were then chipped after reconditioning for approximately four weeks at 65° F. Of the 42 third-year selections and 56 fourth year selections, 25 selections had an Agtron reading above 40 when chipped out at 43° F storage; however, after reconditioning, several selections had Agtron readings above 50. The outstanding chippers were again ND860-2, ND698-1, and are derived from Dr. Florian Lauer's potato breeding program at Minnesota and have Solanum phureja in their breeding.

Processing Tests - French Fry and Flakes. The Food and Nutrition Department at North Dakota State University evaluated the french fry and flake samples. Sensory scores were made for color, flavor and texture. French fry quality was evaluated for 28 selections, however, seven cultivars and selections were dropped because of poor horticulture characteristics, therefore, only 21 are found in North Dakota Table 6. A similar situation occurred for flakes as 12 were tested for flake quality, however, data is recorded for only eight.

Processing Tests - Culinary. Boiling and baking tests on 25 selections and cultivars grown in statewide potato cultivar trials at Grand Forks and Park River, North Dakota were conducted (North Dakota Table 7). As in the past, the high specific gravity selections showed some sloughing when boiled. However they were generally also the ones with the most mealiness when boiled and baked. Redsen, ND463-1R and Bison showed some after-cooking darkening.

Summary. Several advanced North Dakota potato selections were tested for chips, french fry and flake quality. Several selections with Solanum phureja in their pedigree chipped fairly well out of 38° F and 43° F storage and most of these selections were as light or lighter in color than Norchip after reconditioning. Chip blistering was also taken on the 42 advanced third-year selections. Although none of the selections tested were better than Norchip in flake quality, 19 selections and cultivars were better than Russet Burbank in overall french-fry quality.

Disease Control and Resistance. Approximately 1000 second year, 150 third-year and 90 fourth-year and older selections were evaluated for disease at the Potato Research Farm, Grand Forks, North Dakota. About half were resistant to scab and silver scurf and almost all selections were susceptible to Verticillium. Approximately 1035 second-year selections were grown in a potato-free area (Absaraka) and evaluated for disease and horticultural characters. Approximately 240 advanced selections were grown at Casselton and evaluated for disease reactions. Approximately 500 selections from these two areas were greenhouse grown and visually indexed for tuber-borne diseases. These selections, as well as parental selections, were also indexed for PVX and PVY using serology (ELISA) and spindle tuber using gel electrophoresis. None were infected with PVX, eight with PVY and three with PSTV. Representative tubers of the 500 selections were grown in

Florida plots for indexing of virus diseases. The disease-free selections were maintained as a source of clean seed for breeding and other purposes. As part of the basic seed-stock program, 19 selections were indexed for disease and released to growers in Beach, North Dakota for increase. Of the 18 selections tested for resistance to PVY, none were resistant. Of the 18 selections tested for resistance to late blight race 0, ND258-1, ND860-2 and ND862-8 were resistant; ND860-2 may also be resistant to PVS. Tests conducted with ND534-4Russ show that this selection becomes infected with PVY but does not show symptoms. Up to 25 percent infection did not cause yield reduction. It is unknown if this selection is tolerant or infected with a mild strain of PVY.



North Dakota Table 1. Spacing, fertilizer, soil type, planting and harvest dates of the 1983 trial.

Location	Row (in.)	Plant (in.)	Fertilizer	Soil type <sup>1/</sup>	Planting date	Harvest date
Park River	38	12	Fall application	Glyndon SL	5/19	9/22
Grand Forks	38	12	20-20-12	Bearden CL	5/17	9/26
Minot	30	14	35# N	Williams L	5/18	9/23
Williston	36	16	None	Williams L	5/20	9/27

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L - Loam  
SL - Silt Loam  
CL - Clay Loam

North Dakota Table 2. U.S. No. 1 yield, percent U.S. No. 1 and total solids of potato cultivars and selections grown in the Red River Valley, 1983.

Cultivar or Selection	Grand Forks				Park River				Average			
	Cwt/A		% U.S. No. 1		Cwt/A		% U.S. No. 1		Cwt/A		% U.S. No. 1	
	U.S. No. 1 Yield	Total Solids	U.S. No. 1	Total Solids	U.S. No. 1 Yield	Total Solids	U.S. No. 1	Total Solids	U.S. No. 1 Yield	Total Solids	U.S. No. 1	Total Solids
Red Pontiac	241	17.1	92	17.1	253	16.5	89	16.5	247	16.8	91	16.8
ND258-1	240	19.4	87	19.4	246	21.6	88	21.6	243	20.5	88	20.5
ND651-9	231	18.2	82	18.2	243	19.2	80	19.2	237	18.7	81	18.7
ND55-7	231	18.6	88	18.6	237	20.1	84	20.1	234	19.4	86	19.4
Crystal	227	19.4	87	19.4	235	20.9	89	20.9	231	20.2	88	20.2
ND678-8	232	18.0	79	18.0	227	19.7	81	19.7	230	18.9	80	18.9
Kennebec	199	17.5	81	17.5	254	19.0	87	19.0	227	18.3	84	18.3
TND22-2	177	20.3	91	20.3	256	20.9	90	20.9	217	20.6	91	20.6
ND791-5R	213	16.7	92	16.7	212	17.1	82	17.1	213	16.9	87	16.9
ND9403-16R	177	17.7	88	17.7	243	18.4	90	18.4	210	18.1	89	18.1
Norchip	204	19.7	79	19.7	213	20.7	74	20.7	209	20.2	77	20.2
ND463-1R	169	18.4	91	18.4	245	19.2	89	19.2	207	18.8	90	18.8
ND388-1Russ	170	18.8	82	18.8	240	19.9	89	19.9	205	19.4	86	19.4
ND860-2	192	19.2	89	19.2	216	20.5	82	20.5	204	19.9	86	19.9
Norland	189	16.9	88	16.9	217	17.5	89	17.5	203	17.2	89	17.2
ND534-4Russ	188	18.8	81	18.8	204	19.4	82	19.4	196	19.1	82	19.1
Redsen	193	17.3	89	17.3	192	17.7	90	17.7	193	17.5	90	17.5
ND294-1R	142	18.0	82	18.0	229	17.7	89	17.7	186	17.9	86	17.9
Norgold Russet	133	17.7	70	17.7	213	19.0	81	19.0	173	18.4	76	18.4
ND1086-7R	137	18.0	89	18.0	205	19.9	90	19.9	171	19.0	90	19.0
Bison	190	17.3	93	17.3	141	18.0	83	18.0	166	17.7	88	17.7
ND392-4Russ	157	16.5	78	16.5	172	17.1	83	17.1	165	16.8	81	16.8
ND731-6R	135	18.8	91	18.8	184	19.7	91	19.7	160	19.3	91	19.3
Lemhi	116	19.9	70	19.9	201	21.2	74	21.2	159	20.6	72	20.6
Russet Burbank	77	19.2	71	19.2	73	19.0	31	19.0	75	19.1	51	19.1
Average	182	18.3	84	18.3	214	19.2	83	19.2	198	18.8	84	18.8

North Dakota Table 3. Total Yield, U.S. No. 1 Yield, Percent U.S. No. 1 and Total Solids of Potato Cultivars and Selections Grown in Western North Dakota Trials - 1983.

Cultivar or Selection	Minot				Williston				Average			
	U.S.		% U.S.		U.S.		% U.S.		U.S.		% U.S.	
	Total Yield	No. 1 Yield	% Solids	No. 1 %	Total Yield	No. 1 Yield	% Solids	No. 1 %	Total Yield	No. 1 Yield	% Solids	No. 1 %
Bison	93	70	20.1	75	79	66	20.3	84	86	68	20.2	80
Crystal	109	91	22.2	83	94	78	23.1	83	102	85	22.7	83
Kennebec	158	138	21.2	87	84	67	21.2	80	121	103	21.2	84
Lemhi	133	114	21.6	86	44	26	21.8	59	89	70	21.7	73
Norchip	171	138	22.7	80	86	66	22.4	77	129	102	22.6	79
Norland	138	125	19.4	91	96	87	18.8	91	117	106	19.1	91
Norgold Russet	119	100	21.6	84	79	64	20.7	81	99	82	21.2	83
Red Pontiac	153	128	18.2	84	81	72	16.9	89	117	100	17.6	87
Redsen	89	74	19.4	83	78	70	19.4	90	84	72	19.4	87
Russet Burbank	164	129	20.3	78	73	32	19.2	44	119	81	19.8	61
ND388-1Russ	140	120	21.6	86	89	69	21.4	78	115	95	21.5	82
ND534-4Russ	137	113	21.4	82	78	61	20.9	78	108	87	21.2	80
Average	137	112	20.8	83	80	63	20.5	78	109	88	20.7	81

North Dakota Table 4. Advanced selection trial grown at Grand Forks,  
North Dakota - 1983.

Selection Number	U.S. No. 1 yield	% U.S. No. 1	Specific gravity	Total solids
ND1130-6	297	90	74.5	18.6
ND649-4R	279	90	75.0	18.6
ND1215-1	271	92	69.0	17.3
ND944-6	267	89	81.0	19.9
ND657-2	255	85	80.0	20.1
ND967-1Russ	250	80	61.0	15.6
ND1145-13R	237	84	63.5	16.2
ND1010-7	230	86	84.0	20.5
ND1118-1	225	87	70.5	17.7
ND1196-2R	224	92	63.5	16.2
ND779-4	223	91	75.0	18.6
T-7-294-1Russ	215	87	78.5	19.4
ND398-1	206	81	80.0	19.7
ND877-1	199	82	70.5	17.7
ND971-5Russ	187	82	76.0	18.8
ND870-4	185	78	84.0	20.5
ND1323-1	180	70	63.5	16.2
NDT5-15-1Russ	175	72	76.5	19.0
ND862-8	166	78	66.0	16.7
ND1028-3R	166	87	64.5	16.5
ND800-4Russ	157	76	68.5	17.3
ND1113-10Russ	154	75	67.0	16.9
ND770-4Russ	149	82	82.0	20.1
ND1107-1	147	73	75.0	18.6
NDT-9-858-2	144	69	77.5	19.2
76T001-3	142	85	64.0	16.2
ND899-6R	141	87	71.0	17.7
ND1098-3Russ	130	58	69.5	17.5
ND799-2Russ	114	58	66.0	16.7
RB5788	55	40	79.5	19.7
Average	192.3	79.5	72.6	18.1

Table 5. 1983 Chip Tests of Cultivars and Selections Grown at Grand Forks and Park River - 1982.

Cultivar or Selection	Agtron						Percent yield average 3 tests		
	0 weeks 38°F		2 weeks 65°F		4 weeks 65°F				
	Grand Forks	Park River	Grand Forks	Park River	Grand Forks	Park River	Grand Forks	Park River	
Bison	11.0	9.3	31.8	19.8	48.0	43.3	33.7	31.7	
Crystal	10.0	11.0	30.3	32.5	42.3	40.3	35.4	35.5	
Kennebec	8.5	7.8	31.3	21.0	43.0	34.3	35.2	33.2	
Lemhi	12.5	14.0	24.3	30.3	35.0	42.5	36.8	35.9	
Norchip	14.0	15.5	33.0	31.8	45.8	52.8	37.4	36.6	
Norgold Russet	9.0	10.8	26.0	23.3	31.3	27.0	36.1	35.4	
Redsen	10.8	7.5	27.5	21.8	42.0	35.3	34.3	33.5	
Russet Burbank	10.8	8.5	26.5	26.0	33.0	42.3	35.8	38.0	
TND22-2	19.0	16.5	40.5	33.3	52.5	55.0	38.9	38.3	
RB 307	10.0	11.8	30.3	30.8	27.5	31.5	34.8	35.0	
ND55-7	15.0	16.5	30.8	26.0	52.5	48.0	37.3	35.7	
ND119-3	15.5	11.0	33.8	23.3	47.3	42.8	35.2	32.5	
ND258-1	14.3	12.0	39.0	34.3	45.8	45.3	35.7	34.9	
ND388-1Russ	12.5	12.3	29.3	21.3	35.0	27.3	37.0	34.5	
ND534-4Russ	8.9	9.8	37.0	31.3	36.3	35.5	35.9	35.8	
ND651-9	18.0	30.5	44.5	50.0	45.8	51.3	36.3	37.2	
ND722-2Russ	14.8	18.3	27.5	23.3	32.0	36.3	38.5	38.3	
ND748-3Russ	10.0	9.5	16.5	14.8	15.5	20.8	32.4	35.1	
ND9403-16R	14.0	10.8 <sup>1/</sup>	47.0	33.3 <sup>1/</sup>	53.5	46.5 <sup>1/</sup>	36.1	33.8 <sup>1/</sup>	
ND398-1	10.8	-- <sup>1/</sup>	42.5	-- <sup>1/</sup>	52.5	-- <sup>1/</sup>	38.8	-- <sup>1/</sup>	
ND657-2	10.8	--	40.0	--	48.0	--	36.0	--	
ND678-8	11.0	--	20.3	--	35.0	--	34.0	--	
ND689-3	9.8	--	23.3	--	39.3	--	33.8	--	
ND698-1	29.5	--	55.0	--	56.8	--	37.0	--	
ND779-4	14.5	--	33.8	--	41.8	--	35.5	--	
ND800-4Russ	10.0	--	31.8	--	31.5	--	34.5	--	
ND860-2	22.8	--	48.0	--	54.3	--	38.2	--	
ND906-11	22.5	--	26.8	--	41.0	--	36.0	--	
ND1010-7	17.0	--	34.0	--	51.0	--	38.5	--	

<sup>1/</sup> No data - Selection not planted at Park River

North Dakota Table 6. French Fry and Flake Tests of Potato Selections and Cultivars Grown in the 1982 Trials<sup>1/</sup>.

Cultivar or Selection	French Fry			Average Score	Ranking
	Color	Texture	Flavor		
Crystal	6.14	6.39	6.17	6.23	11
Kennebec	5.61	6.28	5.59	5.83	16
Lemhi	5.28	6.33	5.67	5.76	18
Redsen	6.14	6.58	6.39	6.37	9
Russet Burbank	5.52	5.57	5.01	5.37	19
Viking	4.42	5.44	4.44	4.77	20
S-1	7.47	6.00	6.86	6.78	8
Ore Ida	6.99	6.82	7.11	6.97	5
TND22-2	7.49	7.48	5.79	6.92	6
ND55-7	7.58	6.90	6.77	7.08	3
ND388-1Russ	5.86	6.42	6.42	6.23	12
ND534-4Russ	5.45	5.94	5.92	5.77	17
ND651-9	7.20	6.98	6.95	7.04	4
ND671-4Russ	7.03	7.13	7.39	7.18	2
ND678-8	7.32	6.94	6.43	6.90	7
ND770-4Russ	5.74	6.84	6.29	6.29	10
ND800-2Russ	4.00	4.97	4.04	4.34	21
ND800-4Russ	6.03	6.06	6.53	6.21	13
ND944-6	8.19	7.50	7.22	7.64	1
ND967-1Russ	5.97	5.61	6.41	6.00	14
ND971-5Russ	5.39	6.28	5.94	5.87	15

  

Flake					
Crystal	7.40	6.75	7.12	7.09	1
Lemhi	7.13	6.11	5.84	6.38	7
Norchip	6.97	6.97	6.99	6.98	2
Redsen	6.98	6.00	6.21	6.40	6
Russet Burbank	6.97	6.23	6.55	6.58	4
TND22-2	7.36	6.49	6.88	6.91	3
ND55-7	5.52	6.39	6.13	6.01	8
ND388-1Russ	6.86	5.88	6.62	6.45	5

<sup>1/</sup>Rating Guide

- 7-9 -- Good
- 5-6 -- Fair, but acceptable
- 1-4 -- Poor, not acceptable



Table 7. 1983 Cooking Tests of Cultivars and Selections Grown at Grand Forks and Park River, North Dakota - 1982<sup>1/</sup>

Cultivar or Selection	Boiling						Baking		
	Sloughing- ing <sup>2/</sup>	Mealiness <sup>3/</sup>	Color			6/ Flavor	Mealiness	Color	Flavor
			After Cooking <sup>4/</sup>	4 Hours After Cooking <sup>5/</sup>	Color				
Bison	9.0	6.4	7.3	6.5		7.6	5.3	6.8	6.3
Crystal	7.8	7.6	8.5	8.3		7.4	7.0	7.3	6.9
Kennebec	8.0	7.3	7.5	7.5		7.7	7.1	7.3	6.9
Lemhi	6.3	8.4	7.9	8.3		7.9	7.1	7.5	7.0
Norchip	8.0	7.3	8.0	7.8		8.0	7.1	7.8	7.1
Norgold Russet	8.0	7.1	7.8	7.3		8.1	7.3	9.3	7.3
Norland	8.3	5.8	7.8	7.5		7.3	5.6	7.8	6.9
Red Pontiac	8.0	6.0	8.8	8.5		7.0	6.1	8.0	6.1
Redsen	7.3	5.7	7.6	6.5		8.0	6.4	7.3	6.6
Russet Burbank	7.3	8.4	7.8	8.8		7.6	7.9	7.0	7.4
TND 22-2	4.3	8.9	8.0	8.0		8.0	7.9	7.5	7.6
RB 307	7.8	7.0	8.1	9.0		7.6	7.3	7.3	6.3
ND55-7	6.8	8.0	8.1	8.3		8.0	7.4	6.8	7.4
ND119-3	8.0	6.6	8.8	8.3		6.6	6.1	9.3	7.0
ND258-1	6.5	8.0	8.0	8.8		7.8	7.6	7.3	7.5
ND294-1R	8.8	5.3	8.3	8.8		6.9	5.0	7.0	6.0
ND372-2R	6.8	7.9	8.0	7.3		7.3	6.0	7.8	6.5
ND388-1Russ	6.0	8.3	7.8	7.8		7.9	8.0	8.3	7.7
ND463-1R	8.8	6.1	7.0	6.8		6.8	6.4	6.8	7.0
ND534-4Russ	7.5	7.4	7.0	8.0		7.4	7.6	6.3	7.0
ND651-9	7.0	8.9	8.8	7.3		7.3	6.1	8.5	6.5
ND722-2Russ	5.8	9.4	8.5	7.8		7.7	8.1	9.0	8.3
ND731-6R	7.8	7.4	8.5	7.8		7.8	6.9	7.5	7.1
ND748-3Russ	7.8	6.5	8.5	8.3		7.1	5.9	7.0	6.8
ND9403-16R	8.5	6.4	7.8	7.8		7.4	4.6	6.0	5.7

1/ Average of two locations (Grand Forks and Park River)

2/ Severe Sloughing - 1; No Sloughing - 10

3/ Not Mealy - 1; Very Dry and Mealy - 10

4/ Dark - 1; Very White - 10

5/ Dark - 1; Very White - 10

6/ Poor Flavor - 1; Excellent Flavor - 10

## OHIO

R.L. Hassell, E.C. Wittmeyer, F.I. Lower, W.A. Gould, D.M. Kelly, G.R. Dyer, R.C. Rowe, R.C. Henne, and Robert Peel.

### Introduction

Over 70 potato varieties and advanced selections were evaluated in trials and test plots across Ohio in 1983. These trials included: (1) A Statewide Trial of 10 entries located on six commercial farms; (2) An observation Trial of 25 newer varieties, along with some older varieties for comparison, located on two of the six commercial farms; (3) A trial of 28 entries on the Ohio Agricultural Research and Development Center (OARDC) Muck Crops Branch at Celeryville; (4) An evaluation of 20 entries in the North Central Regional Trials located at the OARDC campus at Wooster; (5) An evaluation of entries in the Northeastern Regional Potato Variety Trials located at the OARDC campus at Wooster; and a trial of 14 entries at the Campbell Institute for Research and Technology, Napoleon, Ohio.

Ten entries were evaluated on six commercial farms located across the state. These farms were selected in order to give different soil and climatic conditions. Eight of the entries (A129.69-1, BR 5991WV16, N.Y. 59, Jemseg, Alaska 114, Denali, Conestoga, and CA 02-7) were included either because they looked promising in previous over-the-state trials or looked promising in the observation trials on two farms in northeastern Ohio. The other two entries (Katahdin and Norchip) were included as standards. The Katahdin has been grown in Ohio for many years and was included as a standard midseason variety. The Norchip was included as a standard for chipping tests. It has been widely grown in Ohio as a chipping variety.

All plots on the six commercial farms were grown under standard cultural and pest control practices as used on those individual farms. Plots consisted of double rows approximately 40 feet long (80 seed pieces) and entries were replicated four times. Stand, vigor, and disease presence were evaluated on selected farms during the growing season.

### Statewide Trials

In the main trials on the six farms, BR 5991-WV16 led in yield of U.S. No. 1 potatoes on four of the six farms and in the average of the six farms. It was in the Observation Plots on two farms for two years prior to 1983 where it led in average yield each year. N.Y. 59 was second in average yield on the six farms in 1983. It led in average yield in the main trials in 1982 and 1980, and was second in 1981. It led in yield in the Observation Plots in 1979 and 1978, the first year.

Katahdin averaged third highest in the main trials in 1983 as it did in 1982. It was fourth in 1981 because W718 was omitted in 1983. A Nebraska seedling A129.69-1 was fourth in average yield in 1983, fifth in 1982, first in 1981 and 1980, and near the top in the Observation Plots in 1978 and 1977. However, all of the above named selections have faults which in some cases has delayed naming of high yielding seedlings (Table 1).

#### Observation Trials

Twenty-six entries were evaluated in the observation plots. Most entries were new, promising lines which were either evaluated previously in Ohio trials or suggested by potato plant breeders.

BR 7093-23, a late maturing clone with oval to oblong tubers, white skin, and good appearance was the highest yielding variety when the yields from the two farms were averaged. Research in Maine indicates the clone has some resistance to early blight, scab, and verticillium wilt, but more testing will be needed in Ohio.

AK 10-1, F 73008, A 972-1, and Simcoe were other promising entries in the top six as shown in Table 2. Simcoe is an early maturing round, white variety from Canada which looked quite promising in Ohio trials in 1983. ND 534-4 and ND 388-1 are russet varieties from North Dakota which have looked promising in limited Ohio tests.

#### Muck Trials

Twenty-eight entries were evaluated at the OARDC Muck Crops Branch in 1983. Varieties: A129.69-1, NY59, Simcoe, Denali, Norchip, Katahdin, CA02-7, Belchip, Jemseg had at least four replications. All others had two or less replications.

WF564-3, NY59, Belchip, BR6949-Wv3, AF303-5 and Katahdin were the top yielders. NY59 had the best overall uniform size and shape with a low percentage of hollow heart. The cultivars with the most hollow heart were Jemseg - 85%, WF564-3 - 90%, and BR-5991-Wv16 - 70%. (Table 3)

#### Northeast Trials

The Northeastern Regional Potato Variety Trial consisted of twenty-two entries with the order of highest yielding were Acadia Russet, CF7688-9, BR5991-Wv16, WF564-3 and CF74135-3.

The Acadia Russet tubers tended to be oblong to long, with considerable field sprouting at harvest. CF7688-9 tubers varied considerably in size with a tendency for second growth. The BR 5991-WV16 tubers were round, white skin, and shallow eyes. The WF564-3 tubers were round to blocky, attractive medium buff skin, and shallow stem end.

On the Basis of field notes and other observations, we rated the top six introductions as follows: N.Y. 59, CF 74135-3, CF 7688-9, BR 5991-WV16, WF 564-3, and BR 7093-23. (Table 4)

Ohio Table 1, Average U.S. No. 1 Yields, Grade, and Stands - Statewide Trials-Six Farms - 1983.

Entry	Average Stand (%)	Average Yields Cwt/A	Average Percent		
			U.S. No. 1	B Size	Culls
BR5991WV16	86.0	263	85.9	7.9	6.2
N.Y. 59	87.4	245	87.4	6.8	5.8
Katahdin	92.4	238	85.7	6.9	7.4
Neb. A129.69-1	82.3	207	81.6	12.1	6.3
Denali	76.5	206	80.8	5.8	12.4
Alaska 114	90.9	205	77.8	18.2	4.0
Ca 02-7	92.0	195	79.6	12.0	8.4
Norchip	83.3	184	75.9	14.3	9.8
Jemseg	77.0	161	72.1	5.2	22.7
Conestoga	80.6	141	84.6	8.0	7.4
Average	84.7	205	81.0	10.0	9.0

Ohio Table 2. Observation Trials- Yield, Grade,  
Specific Gravity, and Chip Color  
(Average of Two Locations), 1983.

Entry	Cwt/ A	% U.S. No. 1	Sp.Gr	Chip Color
BR7093-23	269	88.8	1.077	1.5
AK 10-1	241	86.5	1.089	1.5
F73008	226	70.1	1.073	1.5
A972-1	220	80.4	1.071	1.5
Simcoe	217	80.6	1.082	1.5
Atlantic	215	87.8	1.082	1.0
Islander	212	84.8	1.073	2.0
Alaclear	211	78.5	1.083	1.5
Yankee Supreme	209	84.5	1.083	1.5
Kennebec	209	77.9	1.075	1.5
A6371-1	201	80.6	1.071	2.0
Superior	201	83.7	1.074	2.0
ND534-4	200	80.9	1.081	2.5
Acadia Russet	200	79.8	1.072	3.0
ND388-1	197	79.0	1.076	1.0
C13	193	81.3	1.082	1.5
WC521-12	190	75.2	1.088	1.5
A6972-2	189	77.2	1.073	2.0
Yankee Chipper	183	76.3	1.079	1.0
AF238-66	177	77.8	1.080	1.5
AK38-2	174	75.7	1.083	1.5
W752	163	79.9	1.087	2.0
N.Y. 63	157	69.1	1.075	3.0
Shepody	125	63.5	1.080	1.5
F72217	118	82.0	1.073	3.5
Average	196	79.3		

Cwt. per A. - U.S. No. 1, 1-7/8" and above. Average  
yield for two farms. Sp. Gr. - Specific Gravity  
determined with PC1 hydrometer at harvest. Chip Color -  
Measured with the PC/SFA standards - 1 to 5 with higher  
numbers darker in color.

Table 3. Yield and Grade Characteristics of Entries  
in Celeryville Muck Trials, 1983.

Entry	Yield Cwt/A	U.S. No. 1	U.S. B-		Culls %	H.H. Nec. %	
		Yield Cwt/A	No.1 %	Size %			
A129.69-1	417	314	75	10	15	44	0
Islander	313	248	79	16	5	55	0
A6971-1	80	107	74	9	17	45	0
A6371-1	170	203	84	8	8	55	0
F72217	21	115	18	55	27	0	0
NY59	514	447	87	5	8	8	0
Simcoe	419	386	92	4	3	40	0
Denali	421	336	80	8	12	57	0
Norchip	394	296	75	7	18	7	0
Katahdin	415	346	83	8	9	30	0
CA02-8	378	325	86	8	6	40	0
Belchip	486	398	82	5	13	68	0
Jemseg	345	259	75	3	22	85	0
Acadia Russet	173	128	74	21	5	0	0
Shepody	391	207	53	8	39	20	0
BR-5991-WV16	598	514	86	5	9	70	0
BR-6949-WV3	413	359	87	8	5	0	0
PF73008	513	256	50	8	42	0	0
BR-7088-18	286	214	75	8	17	50	0
WF564-3	585	462	79	7	14	90	0
B5662-WV13	366	304	83	5	12	20	0
AF303-5	396	349	88	9	3	30	0
BR7093-23	351	316	90	7	3	30	0
CF7688-9	433	333	77	7	16	30	0
CF74135-3	384	300	78	15	7	0	0
Superior	313	263	84	4	12	30	0



Ohio Table 4. Gross Yield, Specific Gravity, Chip Color, Hollow Heart, and Internal Necrosis. Northeastern Regional Trial, Wooster - 1983

	Gross Yield (CWT/A)	Specific Gravity <sup>1</sup>	PC/SFA Color <sup>2</sup>	H.H. <sup>3</sup>	I.N. <sup>4</sup>
Acadia Russet	271.6	1.074	4	0	1
Denali	206.9	1.074	2	0	1
Katahdin	186.7	1.063	3	0	7
Nobless Russet	179.6	1.078	2	0	0
Shepody	161.7	1.084	2	0	1
Simcoe	154.3	1.070	2	0	2
Superior	205.3	1.078	2	0	3
AF238-66	222.6	1.085	2	0	0
AF303-5	210.9	1.079	3	0	2
B 5662-WV13	147.6	1.073	2	0	0
B 6949-WV3	172.2	1.069	2	0	6
BR 5991-WV16	257.7	1.083	2	0	3
BR 7088-18	210.5	1.085	1	0	5
BR 7093-23	236.8	1.074	2	0	5
CF 74135-3	238.4	1.071	1	0	0
CF 7688-9	267.0	1.083	2	0	0
CF 76183-2	197.2	1.065	2	0	3
CF 77154-10	204.1	1.083	2	0	5
F 73008	178.5	1.069	3	0	0
N.Y. 59	209.3	1.074	4	0	2
N.Y. 63	186.5	1.075	2	0	3
WF 564-3	242.0	1.075	1	0	4

<sup>1</sup>Specific gravity and chip determined by Dr. W.A. Gould and assistants. PC1 hydrometer used for specific gravity.

<sup>2</sup>Chip color read by PC/SFA scale, 1 to 5

<sup>3</sup>H.H. refers to number of tubers in 30 tubers showing hollow heart.

<sup>4</sup>I.N. refers to number of tubers in 30 tubers showing internal necrosis.

Ohio Table 5. Field Evaluation of 14 Potato Varieties  
Grown at Napoleon - 1983, Campbell Institute of Research and Technology

Variety	Total Yield CWT/A	Specific Gravity	Percent Marketable (over 1 7/8")	Marketable Yield 100# Bags/A
NY 59	444	1.069	90.2	401
Simcoe	434	1.074	89.1	388
Denali	405	1.086	75.6	307
Katahdin	394	1.068	88.7	352
Norchip	356	1.070	66.9	249
Islander	355	1.060	75.9	273
Neb. 129-69-1	336	1.072	67.5	231
Belchip	332	1.069	89.2	299
CA 02-7	303	1.076	60.6	190
Shepody	247	1.079	64.5	161
Jemseg	242	1.060	88.1	215
A 6371-1	233	<1.060	74.6	174
Bayes LSD .05	42		4.4	38
C.V.	13.2		6.0	15.0
A 972-1	358		83.7	299 only
A 671-1 -- only 5 to 10% stand -- no data collected				seed for 2 reps

Location - Research Farm, Napoleon, Ohio  
Planting Date - May 18, 1983  
Harvest Date - October 7, 1983  
Experimental Design - Randomized Block  
Number of Entries - 14  
Number of Replications - 4  
Row Spacing - 34 inches  
Plant Spacing - 10 inches  
Plot Size - 1 row, 20 feet long  
Fertilizer - 500 lbs., 10-10-30, broadcast;  
- 500 lbs., 16-16-16, at planting  
Disease & Insect Control - Maneb & Sevin  
Herbicide - Lasso/Sencor pre-TM (Tank Mix)

## OREGON

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### Introduction

Twelve varietal trials were conducted by the authors in 1983. Data from the Columbia Basin and Willamette Valley will be emphasized in this report. Additional information for the Ontario, Klamath Falls and Redmond areas is available from the authors.

Commercially acceptable cultural and pest control practices were used in all tests. Typical planting and harvest dates were used. Vines were killed approximately 110 days after planting in the Willamette Valley and after 140 days at Hermiston. Tubers were harvested about 10 to 14 days after vine kill.

Plots were single 25-foot rows replicated either three or four times in randomized block designs.

### Columbia Basin Trials

Seven plantings were made at Hermiston. The Statewide and two Western Regional Trials were grown on-station; four additional plantings were located on nearby commercial farms.

Western Regional Trials. Two Western Regional trials were planted to allow for harvest on August 3 (early) and October 12 (late). Norgold was included in both tests as an early check variety; Russet Burbank served as a late check in the second planting. As expected, yields were relatively low for the August 3 harvest (Table 1). However, at least two entries, A74212-1 and ND534-4, yielded as well as or slightly better than Norgold. ND534-4 was particularly impressive since it was planted some three weeks later than all other entries. It produced a high percentage of U.S. No. 1 tubers and was only slightly less mature than Norgold at harvest and showed higher specific gravity. Experience elsewhere has shown that ND534-4 is not a good processor, at least out-of-storage, due to high sugars.

Five entries yielded as well or better than Russet Burbank in the late (October 12) harvest (Table 2). Only three of these, A72685-2, A69870-3 and A74212-1, are recommended for further testing. A75188-3 was extremely prone to scab and growth cracks while A7411-2 was too deep-eyed.

Statewide Trial. Thirty-three varieties and selections were compared to Norgold and Russet Burbank in the Hermiston Statewide Trial (Table 3). These same entries were tested in similar plantings at Klamath Falls, Powell Butte and Ontario in 1983. Most entries were relatively new to Oregon. Fifteen of the 355 entries yielded as well as or better than Russet Burbank on a U.S. No. 1 basis and at least 11 produced total

yields as high. Entries identified by an asterisk (\*) under comments will be evaluated further in 1984 and thereafter. Some will eventually be tested in the Western Regional Trial at up to 10 locations.

One of the more promising selections tested at the CBARC in 1983 was ND534-4 (Table 1). Seed was received too late for planting at the same time as the trials described above. It appeared, though, that ND534-4 yielded as well as any entry tested despite the late planting date. It matured almost as early as Norgold and seemed to yield better for early harvest. At the same time, late yields were high. Tests at other locations have also shown excellent yielding and grade-out potential. ND534-4 did not process well from storage, however. Limited information suggests it might store satisfactorily for tablestock use.

On-farm Trials. Seven varieties and advanced lines were tested on four commercial farms in the Hermiston area (Table 4). One planting was lost. Russet Burbank and Norgold were included as standards. None of the entries were outstanding. However, A72685-2, A69870-3 and A74212-1 will probably be tested further. Not much is known about the processing potential of these selections but none are expected to fry satisfactorily from storage.

#### Willamette Valley Trials

Varieties were compared at Corvallis and on a commercial farm at Wilsonville in 1983. These tests were aimed primarily at the potato chip market but also catered somewhat to local tablestock producers. The Corvallis trial was damaged by late blight and by missing plots. Monona and New Norchip yields (Table 5) were lost due to pilferage. Yields of other varieties might have been altered even though efforts were made to compensate for lost hills. The Wilsonville planting (Table 6) was not affected by disease or thievery, and yields were representative for commercial farms in the area.

Several entries yielded and chipped well at Corvallis (Table 5). Rosa, for example, yielded considerably more than Norchip and chipped equally as well from storage. Yankee Chipper, Denali and Wischip No. 16 also chipped well. ND534-4 and Redsen showed some promise for fresh market although yields were not outstanding at Corvallis, possibly due to the factors mentioned.

Rosa produced high yields of relatively smooth tubers at Wilsonville (Table 6) as did most other selections when compared to Norchip or Russet Burbank. ND534-4 tubers were extremely attractive. It appeared that this selection might be well adapted to tablestock uses in the Willamette Valley. ND678-8 chipped well in Corvallis in 1982 but not in 1983. Redsen tubers were an attractive bright red but prone to shatter bruise.

Oregon Table 1. Early-season yield and quality characteristics of Western Regional selections at Hermiston, 1983.<sup>1</sup>

Entry	Cwt/A		Percent US #1	Specific gravity	Comments <sup>2</sup>
	US #1	Total			
A74212-1	356	469	76	1.068	O. Lt. Rus.
ND534-4 <sup>3</sup>	325	421	77	1.072	O. Dk. Rus. Good Mature
Norgold	306	407	75	1.066	O. Med. Rus. Mature
Lemhi	272	372	73	1.076	O. Med. Rus. Severe BS
A72685-2	255	350	73	1.076	O-B. Med. Rus.
A74133-1	172	297	58	1.075	R-O. Lt. Rus.
A69870-3	216	283	76	1.070	R-O. Dk. Rus. Flat. HH, BS
A75188-3	125	254	49	1.068	O. Rus. Severe GC
NDD277-2	155	218	71	1.065	R. White. Severe Scab
NDD47-1	72	145	50	1.069	O. Lt. Rus.
LSD, .05	66	66	-	0.002	

<sup>1</sup>Planted March 31, killed July 21, harvested August 3.

<sup>2</sup>Shape: O = oblong, R = round. External faults: GC = growth cracks. Internal faults: BS = blackspot; HH = hollow hearts.

<sup>3</sup>Planted April 21.

Oregon Table 2. Yield and quality characteristics of Western Regional selections at Hermiston, 1983.

Entry	Cwt/A		Percent US #1	Specific gravity	Comments <sup>2</sup>
	US #1	Total			
A72685-2	762	808	95	1.088	R-O. lge. Med. Rus. Shatter. OK.
A751883	578	743	78	1.080	Skins. Scabby. GC. Drop.
A69870-3	711	741	96	1.084	R-O. Med. Rus. Flat but OK.
A74212-1	629	717	88	1.077	O. Lt. Rus. Fair shape.
A7411-2	565	681	83	1.093	L. Deep eyes. Med. Rus. Fair.
R. Burbank	514	644	80	1.084	Typical. Mild scab.
Lemhi	575	636	90	1.087	Too dark. Angular. Fair.
A74133-1	551	593	93	1.083	R-B. Lt. Rus. Shatter. Drop.
NDD47-1	494	545	91	1.081	O. White. Scabby. Drop.
NDD277-2	440	487	90	1.082	R. White. GC. Scab. Drop.
Norgold	318	368	86	1.066	Small but good Rus.
LSD .05	138	146	-	0.004	

<sup>1</sup>Planted April 4, killed September 23, harvested October 12.

<sup>2</sup>Shape: R = round; O = oblong; L = long; B = blocky. Skin: GC = growth cracks.



Oregon Table 3. Yield and quality characteristics of thirty-five potato varieties and selections at Hermiston, 1983.

Entry	Cwt/A		Percent Specific		Comments <sup>1/</sup>
	US #1	Total	US #1	gravity	
ND451-1	848	945	90	1.088	* O-L. Lt. Rus. Deep eyes. EH.
A71997-8	837	905	92	1.080	* R-O. Dk. Rus. Shatter. GC, EH.
Bintje	584	902	65	1.072	Yellow flesh. Scabby. White skin
A72685-2	805	874	92	1.088	* O. Med. Rus. Lge. Good.
A69657-4	724	870	83	1.084	O. Lt. Rus. Deep eyes. Drop?
A77254-1	785	839	93	1.084	O-L, Dk. Rus. Sev. shatter.
A74212-1	704	832	85	1.076	* O-L, Lt. Rus. Pointed.
A7279-12	782	830	94	1.099	* O. Flat, Smooth. Med. Rus. PVX & S
A7242-3	719	776	93	1.085	* Scabby. Flat. Lt. Rus.
A74123-7	711	774	92	1.084	* Knobs, deep eyes. Rough. Drop.
TXA657-27	680	767	89	1.077	O. Hvy. Rus. Angular. Fair.
R. Burbank, 81 VTSC	589	745	79	1.082	L. Lt. Rus. Dumbells. Drop.
A69870-3	668	712	94	1.082	*O. Med. Rus. Good skin. Too flat?
Lemhi	649	695	93	1.086	*O-L. Med. Rus. Deep eyes. OK.
A72602-2	652	683	95	1.093	R. Dk. Rus. Cracks. Drop.
A7735-1	611	679	90	1.086	Dk. Rus. Sev. shatter.
ND681-3	595	666	89	1.083	* O. Lt. Rus. Skinning. Fair.
A7727-1	584	653	89	1.098	O. Dk. Rus. GC. Ugly.
A71996-4	582	643	90	1.072	
A77153-3	578	635	91	1.093	* O-L. Med. Rus. Scabby. Drop.
ND385-4	536	622	86	1.081	O. Lt. Rus. Crescents.
ATP62-3	512	573	89	1.076	B. Med. Rus. Shatter. Drop?
A77254-9	500	569	88	1.079	O-L. Med. Rus. Good.
A68678-2	491	560	88	1.082	* 100% virus. L. Dk. Rus.
A7787-3	464	549	84	1.068	R-O. Dk. Rus. Shatter. GC.
TXA582-4	476	517	92	1.100	
A77529-8	435	509	85	1.083	R-O. Dk. Rus. Nice.
A77131-5	428	498	86	1.088	R-O. Dk. Rus. Fair.
NDA8694-3	446	493	90	1.085	R. Lge. Med. Rus. Scabby.
A77236-6	357	460	78	1.089	O. Lt. Rus. Small.
Norgold	406	450	90	1.067	* O. Med. Rus. Small. Fair.
A7683-16	350	399	88	1.069	R. Sm. Lt. Rus. Drop.
B8972-1	273	309	88	1.062	R-O. Dk. Rus. Shatter.
A77532-4	239	293	81	1.076	O. Med. Rus. Smooth.
A7742-6	-	-	-	.-	- No yield. Metribuzin.
LSD, .05	167	181	-	0.004	

<sup>1/</sup> Shape: B = blocky; L = long; O = oblong; R = round. Skins: EH = elephant hide; GC = growth cracks.

\* Will be tested further.



Oregon Table 4. Yield and quality characteristics of potato varieties and selections under commercial conditions at Hermiston.\*

Entry	Cwt/A, US #1			Total Cwt/A			Specific gravity			Comments
	E.R.	R.F.	W.F.	E.R.	R.F.	W.F.	E.R.	R.F.	W.F.	
A69870-3	485	627	555	573	682	640	1.093	1.082	1.083	Oblong. Med. Rus.
A7242-3	419	514	338	521	617	476	1.086	1.074	1.078	Oblong. Lt. Rus. Bottle-necks. Flat.
A72685-2	489	641	535	640	745	685	1.091	1.078	1.086	Oblong. Lt. Rus. Flat.
A74212-1	502	708	400	646	829	575	1.085	1.072	1.075	Blocky. Med. Rus. Bottle-necks.
Lemhi	412	601	486	549	727	622	1.087	1.078	1.081	Oblong. Med.-heavy Rus. Cracks.
R. Burbank	302	569	404	495	746	604	1.087	1.079	1.078	Long. Med. Rus.
Norgold	291	-	265	382	-	387	1.080	-	1.072	Round-oblong. Med. Rus.
LSD, .05	-	-	-	103	183	138	0.003	0.005	0.002	---

\*E.R. = Eagle Ranch; R.F. = Royal Farms; W.F. = Walchli Farms.

Oregon Table 5. Performance of seventeen varieties at Corvallis, 1983.

Variety	Yield Mkt	Cwt/A Total	Percent Mkt	2 in	Culls	oz/ tuber	Specif. gravity	Chip color	Comments
Yankee Supreme	357	417	85.8	7.7	6.5	7.2	1.087	5.0	Good grade-out, yield.
Yankee Chipper	208	330	63.2	26.2	10.6	5.8	1.092	4.0	Good chipper.
Islander	218	307	71.6	20.8	7.6	5.0	1.083	8.0	No promise.
R. Burbank	290	517	57.3	24.0	18.6	8.1	1.096	8.0	Rgh. Long Rus.
ND388-1	249	312	79.7	9.1	11.2	6.5	1.090	7.0	Oblong Rus. Dk. Rgh.
ND534-4	201	280	71.0	19.9	9.1	6.2	1.084	9.0	Smooth, oblong Rus.
Redsen	262	340	76.7	14.8	8.5	6.3	1.084	10.0	Red. Shatter. Good color.
ND678-8	304	422	72.1	18.2	9.7	5.2	1.086	7.0	Rd. white, OK.
Monona	-	-	-	-	-	6.2	1.074	6.0	Typical.
Rosa	300	400	74.8	13.4	11.7	6.1	1.090	4.0	Pink eyes. OK.
New Norchip	-	-	-	-	-	5.3	1.089	7.0	Later than normal?
Denali	226	333	68.0	8.2	23.7	6.4	1.092	4.0	Lge. White. Scabby?
Wischip, Late	196	282	69.4	20.1	10.4	5.3	1.084	5.0	Small, round.
Wischip, B's <sup>2</sup>	181	269	67.3	27.3	5.3	4.2	1.079	6.0	Small, round.
Norchip	180	299	60.1	15.9	24.0	4.7	1.084	4.0	Rough. Deep eyes. Small.
Wischip 19	245	334	74.1	18.0	7.9	5.2	1.077	6.0	Small, round.
Wischip 16	269	362	74.4	16.4	9.2	6.1	1.084	4.0	Small, round.
LSD, .05	44	65	7.5	6.0	6.4	-	0.006	-	---

<sup>1</sup>/Potato Chip Color Reference Standard, Potato Chip Institute International.

<sup>2</sup><sup>1</sup> = light; 10 = dark.

<sup>2</sup>/B-size, single-drop seed tubers

Oregon Table 6. Performance of ten varieties at Wilsonville, 1983.<sup>1/</sup>

Variety	Yield, Cwt/A		Percent			Specif. oz/		Comments
	MKT	Total	MKT	2in	culls	gravity	tuber	
Norchip	297	420	72.7	9.8	17.5	1.079	6.2	Rgh. Deep eyes.
New Norchip	293	384	76.3	16.3	7.4	1.084	5.3	Later than normal?
Denali	384	421	91.4	5.8	2.8	1.097	8.5	Lge. Scab?
ND 534-4	365	433	84.0	12.6	3.3	1.068	7.7	Smooth. Oblong. Med. Med.
R. Burbank	339	505	67.1	20.6	12.3	1.088	7.5	Long. Rus. Poor shape.
Wischip	321	391	81.9	13.5	4.5	1.072	5.2	Rd. Good skin. Small.
Rosa	420	516	81.7	14.0	4.2	1.083	6.5	Fairly smooth. Pink eyes.
Redsen	307	391	78.5	20.0	1.5	1.067	5.4	Good red. Shatters.
ND 388-1	329	399	82.4	10.0	7.6	1.081	6.5	Oblong. Rus. Rough.
ND 678-8	453	571	79.2	19.1	1.7	1.075	5.7	Smooth. Rd. White.
LSD, .05	NS	NS	5.8	3.9	4.2	.005	-	---

<sup>1/</sup>Grown in a commercial field on Bischof Farms.

J. Creighton Miller, Jr. and Douglas G. Smallwood

Variety  
Development and  
Testing

Seedling Program. Approximately 30,000 first-year seedlings, representing 276 families, were grown for selection near Hereford in 1983, and 71 original selections were made from this material. The 1983 first-year seedlings from Texas resulted from crosses made at the Texas Agricultural Experiment Station near Lubbock during the winter of 1981-82. The remainder were obtained from Joe Pavcek in Idaho (10,520), Bob Johansen in North Dakota (13,229) and Florian Lauer in Minnesota (3000). The Texas program also supplied the North Dakota and Idaho programs with second, third and fourth sized seedling tubers for selection.

Adaptation Trials. Some 565 entries were grown in replicated and nonreplicated trials at two locations in West Texas. This provided for testing both on sandy soil with center pivot irrigation (Olton) and on clay or tight soil (Hereford) where the furrow irrigation method is used. Not all entries were included at each locale. Only selected trials are included in this report.

The variety and advanced selection trial at Hereford (Table 1) was planted on March 15 and harvested on August 8. The outstanding red entry was the promising selection NDTX 9-1068-11 R. Other reds deserving mention, include: Red LaSoda, Batoche and TXA 218-7. Several russet selections were outstanding in performance. Those deserving mention include: TX 9-646-4 Ru, ND 1113-10 Ru, TX 9-649-9 Ru, ATX 9-77266-2 Ru and Norgold #12 (Barrett). Of the named russet varieties, other than Norgold Russet, Lemhi was the outstanding performer. Fourteen Norgold Russet strains, as well as regular Norgold Russet, were included in this trial. The relative ranking based on total yield, was as follows: Norgold #11 (Shaver), Norgold #11 (Barrett), Norgold #20, Norgold #12 (Shaver), Norgold #35, Norgold "D", Norgold "M", Norgold #10, Norgold #19-0, Norgold #19, Norgold #19-16, Norgold #19-6, Norgold #19-1, regular Norgold Russet and Norgold #40. The inconsistency in performance of the strains, from year to year, remains a problem. Norgold #11 (Shaver), Norgold #12 (Shaver), and Norgold #12 (Barrett) received the highest ratings, based on overall performance.

The variety and advanced selection trial at Olton (Table 2) was grown on relatively sandy soil in contrast to the heavy clay soils in Hereford. The outstanding white entry based on total yield and overall performance was TX 9-652-10 W, while the outstanding red variety based on total yield was clearly Red LaSoda. The most notable russet selections

based on overall performance were ATX 9-77254-5 Ru and TX 9-646-6 Ru. The relative ranking of the Norgold strains, based on total yield, was as follows: Norgold #19-6, Norgold #40, Norgold #19, Norgold #11 (Shaver), Norgold #19-1, Norgold #35, Norgold "M", Norgold #19-0, Norgold #12 (Shaver), Norgold #20, Norgold #11 (Barrett), Norgold #19-16, Norgold #12 (Barrett) and regular Norgold Russet. There was a 164 cwt. difference between the highest yielding Norgold strain and regular Norgold Russet. Norgold #11 (Shaver), Norgold #19-1 and Norgold #10 received the highest ratings, based on overall performance.

Summarizing results from all trials at both Hereford and Olton, the most promising selection was NDTX 9-1068-11 R. Two russet selections which performed well at both locations were TX 9-646-4 Ru and TX 9-646-6 Ru. These and other selections are being increased in our newly initiated rapid multiplication program.

Texas Table 1. Total yield, percent by weight over 4 ounces, average weight per tuber in ounces, specific gravity, vigor, maturity and general rating of 66 potato varieties or selections grown at Hereford, Texas - 1983.

Variety or Selection	Total Yield CWT/A	Percent by Wt. Over 4 oz.	Average Weight/ Tuber in oz.	Specific Gravity	Vigor <u>1/</u>	Maturity <u>2/</u>	General Rating <u>3/</u>
TX 9-646-4 Ru	323.2	85.1	6.6	1.067	3.6	3.5	3.5
ND 1113-10 Ru	309.2	82.2	6.0	1.070	3.5	3.5	3.5
ND 258-1 W	301.1	82.1	5.6	1.079	2.8	3.5	3.1
NDTX 9-1068-11 R	289.8	88.9	6.0	1.072	3.0	2.5	3.8
TX 9-649-9 Ru	278.2	93.7	7.8	1.060	3.1	3.3	3.4
Lemhi	277.6	83.3	5.8	1.079	4.3	2.0	3.6
A 69-72-1 (Shaver)	277.3	83.3	6.0	1.064	3.8	2.6	3.2
TXND 22-2 W	273.8	78.4	3.9	1.076	3.6	3.1	2.7
ND 1215-1	268.9	84.0	4.6	1.066	3.8	2.3	3.1
ATX 9-77266-2 Ru	266.0	79.7	4.4	1.066	3.5	3.3	3.1
Norgold #11 (Shaver)	258.4	79.6	5.6	1.068	3.8	3.1	3.6
Norgold #11 (Barrett)	256.7	81.5	6.0	1.072	3.3	3.4	3.3
Norgold #20	256.1	79.9	5.6	1.066	3.4	3.5	3.5
Norgold #12 (Shaver)	255.5	82.3	5.1	1.073	3.7	3.5	3.6
Red LaSoda	253.2	84.7	6.8	1.067	4.0	3.0	3.3
Batoche	252.6	91.0	6.7	1.071	3.4	2.9	3.3
Kennebec	252.0	87.0	7.7	1.066	4.1	2.9	3.8
Sangre	251.7	88.3	6.5	1.066	3.3	2.8	2.9
New Norchip	250.3	82.5	4.8	1.079	3.8	2.7	2.9
TX 9-682-10 Ru	250.3	82.1	5.0	1.070	3.1	3.5	2.9
Norgold #35	247.1	74.1	5.2	1.062	3.1	3.8	3.4
TXA 218-7	245.3	83.2	7.0	1.068	3.0	3.5	2.8
Norgold #12 (Barrett)	243.3	79.0	6.5	1.065	3.3	3.7	3.6
TX 7-294-1 Ru	242.1	68.8	3.8	1.079	3.1	2.9	3.1
A 74114-4	241.6	81.4	6.1	1.070	2.8	2.6	2.9

continued



Texas Table 1. Continued

Variety or Selection	Total Yield CWT/A	Percent by Wt. Over 4 oz.	Average Weight/ Tuber in oz.	Specific Gravity	Vigor <u>1/</u>	Maturity <u>2/</u>	General Rating <u>3/</u>
NDTX 9-858-2 W	239.8	76.2	4.4	1.072	3.2	3.9	2.7
Norgold "M"	239.8	77.8	5.2	1.069	3.2	3.9	3.5
Denali	236.3	80.2	4.7	1.087	3.6	1.9	3.0
ND 731-6 R	230.5	88.9	5.8	1.073	3.0	3.5	2.9
Belchip	230.2	80.6	5.8	2.075	3.6	3.1	2.8
ATX 9-7738-9 Ru	228.8	69.9	4.4	1.078	3.2	3.5	2.9
Norgold #10	288.2	77.1	5.5	1.062	3.3	3.5	3.1
ND 398-1 Ru	227.3	82.5	4.4	1.075	3.0	3.5	3.1
ATX 8-71881-2 Ru	226.8	89.7	7.0	1.059	3.4	3.7	3.1
ATX 9-7738-8 Ru	225.3	84.1	5.6	1.076	2.9	3.1	3.0
Norgold #19-0	223.8	77.5	4.8	1.063	3.6	3.3	3.5
A 143.70-2	221.2	86.3	5.3	1.067	3.1	3.0	3.1
76T001-8 W	221.2	89.8	5.4	1.058	3.2	4.1	3.3
Norgold #19	220.7	82.2	5.6	1.064	3.4	3.1	3.5
Norgold #19-16	220.7	81.4	6.3	1.064	3.1	3.1	3.4
A 74595-11	218.6	74.7	5.9	1.081	4.0	2.2	2.8
TX 9-646-6 Ru	218.0	95.6	8.2	1.065	3.9	1.9	3.3
ND 388-1 Ru	217.5	76.3	5.3	1.076	3.2	3.1	2.9
ND 657-2	213.1	72.9	4.6	1.076	2.8	4.1	3.0
Norgold #19-6	207.9	78.9	5.5	1.057	3.6	3.1	2.9
Norgold #19-1	205.3	79.4	5.6	1.063	3.5	3.1	2.9
Dark Red Norland #13	205.0	83.2	5.5	1.065	3.1	3.3	2.8
ATX 9-77259B-7 Ru	196.8	71.6	3.8	1.071	3.2	3.6	2.8
ATX 0-7809-2 Ru	196.0	67.3	4.7	1.069	3.1	3.3	2.8
ATX 9-77259B-8 Ru	192.8	87.4	5.1	1.070	3.1	3.5	3.2
ND 967-1 Ru	188.7	53.8	3.9	1.066	2.8	4.0	2.5
Belrus #12	186.1	64.6	4.2	1.073	3.2	3.1	3.1
Norgold Russet	185.2	69.0	4.7	1.066	2.6	4.0	2.8

continued

Texas Table 1. Continued

Variety or Selection	Total Yield CWT/A	Percent by Wt. Over 4 oz.	Average Weight/ Tuber in oz.	Specific Gravity	Vigor <u>1/</u>	Maturity <u>2/</u>	General Rating <u>3/</u>
A 7411-2	183.2	77.7	6.6	1.080	3.8	2.4	2.9
ATX 9-77254-16 Ru	181.7	67.6	3.7	1.080	3.8	3.1	3.0
A 63-71-1 (Shaver)	181.2	80.4	5.3	1.059	4.1	2.1	3.5
ND 770-4 Ru	169.5	78.3	5.0	1.075	2.2	3.1	2.9
A 63-71-1 (Barrett)	142.5	80.1	5.4	1.059	4.1	2.2	3.1
ND 860-2	142.2	62.4	3.6	1.074	2.3	3.8	2.1
NDTX 5-15-1 Ru	142.2	50.0	3.3	1.070	2.3	3.8	2.9
Redsen	138.2	63.7	4.2	1.066	2.5	4.0	2.3
Norgold #40	136.7	60.8	4.6	1.069	4.1	2.1	2.8
Norland #4	128.0	65.6	3.5	1.061	2.2	3.5	2.5
ND 1145-13 R	112.6	57.2	3.1	1.063	2.9	4.1	2.6
A 69-72-1 (Barrett)	83.6	37.9	3.7	1.064	2.0	4.1	2.0
ND 649-4 R	49.6	76.0	3.6	1.066	1.9	3.1	2.2
Average	219.2	77.7	5.3	1.069	1.9	3.2	3.1
L.S.D. (.05)	46.7	6.4	1.0				

1/ 1 = poor or weak, 2 = fair, 3 = medium, 4 = vigorous, 5 = very vigorous

2/ 1 = very late, 2 = late, 3 = medium, 4 = early, 5 = very early

3/ 1 = very poor to 5 = excellent

Texas Table 2. Total yield, percent by weight over 4 ounces, average weight per tuber in ounces, specific gravity, vigor, maturity and general rating of 84 potato varieties or selections grown at Olton, Texas - 1983.

Variety or Selection	Total Yield CWT/A	Percent by Wt. Over 4 oz.	Average Weight/ Tuber in oz.	Specific Gravity	Vigor <u>1/</u>	Maturity <u>2/</u>	General Rating <u>3/</u>
Red LaSoda	373.7	73.5	4.6	1.066	3.6	2.0	3.3
Lemhi	341.8	77.8	5.6	1.074	4.1	1.9	2.8
Norgold #19-6	331.0	71.7	4.5	1.060	3.3	2.6	2.8
ATX 9-77254-5 Ru	314.2	10.9	2.3	1.071	4.1	2.2	3.0
Norgold #40	300.2	53.0	3.5	1.068	4.0	2.0	2.7
TX 9-652-10W	291.5	59.6	4.3	1.078	3.6	2.8	3.3
Belchip	290.1	63.3	3.9	1.082	3.1	2.9	2.7
Norgold #19	285.4	60.4	3.9	1.066	3.1	3.6	3.0
Denali	285.1	62.8	3.8	1.089	3.1	2.7	3.0
A 143.70-2	282.5	62.2	3.7	1.064	2.6	2.8	2.8
Norgold #11 (Shaver)	279.9	70.1	4.3	1.065	3.1	3.6	3.3
New Norchip	278.2	56.3	3.1	1.079	3.3	3.1	2.9
TX 9-684-1 Ru	276.1	71.0	4.1	1.073	2.9	3.3	3.0
A 69-72-1 (Shaver)	275.2	57.2	3.7	1.064	2.7	3.7	2.9
Dark Red Norland #13	270.3	62.7	4.0	1.072	3.1	3.5	3.1
ATX 9-7738-9 Ru	269.7	47.7	3.4	1.065	2.1	4.0	2.7
Sangre	267.7	60.0	3.6	1.072	2.9	3.0	2.8
TXA 218-7	267.7	76.9	5.8	1.064	2.8	3.3	2.9
Kennebec	266.2	78.9	5.5	1.070	3.3	3.5	3.3
ATX 9-7809-2 Ru	255.5	52.7	3.1	1.081	3.1	3.1	2.5
TX 7-294-1 Ru	254.3	53.0	3.1	1.072	2.4	3.0	2.8
A 7411-2	253.8	51.1	3.9	1.080	3.8	3.6	2.7
Batoche	252.0	77.3	4.7	1.069	2.9	3.1	3.0
TX 9-646-6 Ru	249.7	95.3	7.6	1.067	3.6	3.1	3.5
Norgold #19-1	248.2	76.5	4.7	1.062	3.7	2.3	3.3
Norgold #35	245.0	52.5	3.4	1.063	2.3	2.6	2.8
TX 9-646-4 Ru	243.9	76.8	4.4	1.072	2.9	3.5	3.0
MN 301.72-1	242.1	59.4	3.5	1.066	2.5	3.1	2.8

continued

Texas Table 2. Continued

Variety or Selection	Total Yield CWT/A	Percent by Wt. Over 4 oz.	Average Weight/ Tuber in oz.	Specific Gravity	Vigor <u>1/</u>	Maturity <u>2/</u>	General Rating <u>3/</u>
Norgold "W"	234.0	65.3	3.9	1.065	2.6	3.7	3.1
ND 258-1	232.3	22.9	2.7	1.078	2.8	3.3	2.7
Dark Red Norland #4	231.4	50.0	2.9	1.061	2.4	3.6	2.8
ATX 9-71S2-2 Ru	229.1	53.7	3.6	1.073	3.3	2.9	3.1
A 74595-11	227.9	55.7	3.6	1.081	3.7	2.3	3.3
Norgold #10	226.8	80.1	5.1	1.062	3.1	3.2	3.4
ATX 9-77259B-7 Ru	226.5	29.0	2.7	1.070	2.7	3.6	2.7
ND 1113-10 Ru	225.9	38.3	3.0	1.068	2.6	3.3	2.9
L 82-119	225.0	25.3	2.3	1.076	2.9	3.3	2.8
Norgold #19-0	224.4	63.6	4.4	1.062	2.6	3.1	3.0
A 74114-4	216.9	69.1	4.4	1.082	2.1	3.7	3.1
MB 9441-1	216.9	31.7	3.0	1.072	3.1	3.1	3.1
Norgold #12 (Shaver)	216.0	54.5	2.9	1.069	2.6	3.6	3.1
ATX 9-77259B-8 Ru	215.7	54.5	3.1	1.075	2.6	3.5	2.7
ATX 9-77266-2 Ru	212.5	52.7	5.2	1.050	2.6	3.6	2.8
Norgold #20	212.2	68.4	4.4	1.062	2.1	4.1	3.0
TX 9-682-10 Ru	211.7	47.0	2.9	1.050	2.3	3.6	2.8
NDTX 9-1068-11 R	211.1	64.2	4.1	1.063	3.1	3.1	2.8
A 63-71-1 (Shaver)	209.6	73.4	4.8	1.064	3.6	3.1	3.8
A 63-71-1 (Barrett)	207.0	78.0	4.9	1.065	3.5	2.3	3.6
Norgold #11 (Barrett)	205.8	48.0	3.6	1.070	2.6	3.3	3.1
NDTX 9-993-5 W	200.9	58.0	3.0	1.076	3.2	3.1	2.6
Norgold #19-16	198.3	78.6	5.5	1.064	3.3	2.7	3.3
Norgold #12 (Barrett)	196.3	69.4	4.4	1.067	2.3	3.6	2.9
ND 860-2	191.9	37.3	2.5	1.081	2.7	3.6	2.6
ATX 9-71881-2 Ru	189.0	77.5	4.3	1.060	2.1	4.3	3.3
TX 9-649-9 Ru	188.0	86.0	5.3	1.059	2.2	3.6	3.1
ND 657-2	187.0	25.6	2.4	1.076	2.3	4.0	2.7

continued

Texas Table 2. Continued

Variety or Selection	Total Yield CWT/A	Percent by Wt. Over 4 oz.	Average Weight/ Tuber in oz.	Specific Gravity	Vigor <u>1/</u>	Maturity <u>2/</u>	General Rating <u>3/</u>
MB 9215-3	186.7	40.2	2.9	1.069	3.1	3.0	2.6
ND 1215-1	184.4	36.7	2.9	1.065	2.7	3.0	2.7
NDTX 9-1015-1 Ru	183.8	13.6	2.2	1.071	2.4	4.5	2.7
MnTX 9-86-1 Ru	179.7	81.1	5.5	1.067	2.6	3.4	2.8
ATX 9-77254-16 Ru	175.9	30.8	2.6	1.071	2.9	3.6	2.8
TXND 22-2 W	174.8	43.0	1.9	1.077	1.8	3.1	2.7
76T001-8 W	174.5	47.6	3.0	1.063	2.6	5.0	2.7
ND 398-1	171.9	37.9	2.3	1.076	2.0	4.1	2.5
ND 388-1 Ru	167.8	45.7	3.2	1.068	2.3	4.1	2.7
Norgold Russet	167.8	37.6	3.2	1.065	2.5	3.6	2.7
TX 9-581-2 Ru	167.8	67.6	4.6	1.080	3.1	3.0	3.2
BelRus Line #12	163.2	54.9	3.0	1.074	3.3	3.0	2.7
ATX 9-77255-7 Ru	159.4	54.2	3.6	1.081	2.3	3.7	2.9
NDTX 9-858-2 W	159.4	39.7	2.5	1.073	2.4	3.3	2.7
NDTX 5-15-1 Ru	154.4	35.2	2.7	1.071	2.3	4.1	2.7
ND 967-1 Ru	152.7	28.1	2.5	1.069	2.4	3.8	2.7
ND 731-6 R	150.4	33.0	2.9	1.075	2.5	3.5	2.8
ATX 9-7738-8 Ru	141.1	67.0	4.0	1.066	1.8	4.0	2.8
Mn 304.72-101	135.3	56.3	3.0	1.068	2.7	3.3	3.1

continued

Texas Table 2. Continued

Variety or Selection	Total Yield CWT/A	Percent by Wt. Over 4 oz.	Average Weight/ Tuber in oz.	Specific Gravity	Vigor <u>1/</u>	Maturity <u>2/</u>	General Rating <u>3/</u>
Mn 1524-71-11	133.0	26.5	1.9	1.071	2.1	4.1	2.7
ATX 9-75446-1 Ru	127.7	26.5	2.5	1.069	2.1	4.3	2.6
MnTX 8-57-1 Ru	119.0	50.3	2.9	1.070	2.5	4.1	2.8
ND 1145-13 R	116.4	17.9	1.7	1.066	2.4	3.6	2.6
ND 770-4 Ru	105.9	42.2	2.5	1.076	2.0	4.0	2.6
Redsen	104.6	0.0	1.5	1.065	1.3	4.6	2.3
Goldrus	96.7	61.1	2.9	1.071	2.0	3.8	2.9
A 69-72-1 (Barrett)	74.6	28.5	2.3	1.064	2.2	3.6	2.3
ND 649-4 R	60.1	30.4	2.0	1.066	2.4	3.3	2.3
Average	215.7	54.1	3.7	1.070	2.8	3.4	2.9
L.S.D. (.05)	42.5	9.0	0.9				

1/ 1 = poor or weak, 2 = fair, 3 = medium, 4 = vigorous, 5 = very vigorous

2/ 1 = very late, 2 = late, 3 = medium, 4 = early, 5 = very early

3/ 1 = very poor to 5 = excellent



## Purpose

Our primary objective is to evaluate round white and russet selections for adaptability to the growing conditions on the Eastern Shore. Improved yield, early sizing, internal and external tuber quality, and processing characteristics (round whites) are also important.

A total of 48 round white and 35 russet varieties and clones were grown in the advanced trials. The observational trials contained 119 russet entries and 210 round white entries.

Plot Procedures  
and Growing  
Conditions

The advanced trials consisted of 25-foot single row plots (12 inches within row spacing) with four replications. Observational trials included non-replicated, 20-foot row plots. Planting was delayed by excessive rainfall until March 30.

All plots received band-placement of 1100 pounds 10-10-10/A at planting. Plots were side-dressed with 50 pounds/A  $\text{NH}_4\text{NO}_3$ -N on June 3. Aldicarb was banded in the seed furrow at 3 pounds ai/A. Metribuzin (0.5 pound ai/A) was applied at drag-off on April 29. Oxamyl (0.25 pound/A) and carbofuran (0.5 pound/A) were applied three times during the growing season for insect control. Plots were irrigated on June 16. Advanced trials were hand-harvested on July 11. Observational trials were dug and field ratings taken on July 12.

The weather conditions during the potato growing season were extreme. Rainfall in late February, March, and April was almost double the 44-year average for this area. Plant emergence was slow and irregular. The fourth replicate of the Advanced Russet trial and some sections of the Observational Trial could not be evaluated because of poor plant stands. The cold, wet spring was followed by heat and drought in late June and July.

## Results

Since the stand count was dependent upon variety, yield could not be adjusted for stand count in the Advanced trials. However, stand count appears to be closely related to total yield and the consideration of the stand count in the interpretation of the yield data is essential.

The adverse growing conditions minimized the percentage of large ( $>2\frac{1}{2}$  inch) potatoes in these trials and in this growing area in general. In addition, growth cracks and heat sprouting in these trials were severe.

Observational Trials. Selections were evaluated for vine maturity and sensitivity to naturally occurring pollution, as well as tuber shape, size, set, and skin color.

Advanced Round White Trial. Selections with nearly perfect stand counts included B8687-23, B8724-2, B9510-5, B9602-12, and B9638-11. Very low stand counts were recorded for B9340-13 (9.5 plants/plot), Belchip (8.8 plants) and Chipbelle (11.5). Plant emergence appeared to be strongly influenced by varietal susceptibility to seed-piece breakdown in the cold, extremely wet soils encountered in March and April.

Greater yields were observed for 12 numbered lines than for Superior. Of these, B9581-10, B9423-4, B9638-11, B8724-2, and B9602-12 had the highest yield. However, it should be noted that the stand counts were also high in these selections (>21.5 plants/plot).

Adverse growing conditions also influenced tuber quality. Heat sprouting was substantial in B7805-1, B8687-13, B9706-7, B9786-20, Pungo, and to a lesser extent in Superior. An unacceptable amount of internal defects was found in B9335-3.

The USDA interregional selections included B8091-8, B8706-7, B9140-32, B9192-1, B9224-6, and B9340-13. Of these, the greatest yield was observed for B9192-1. Tuber qualities of B9192-1 were very good, but growth cracks could be a problem.

Advanced Russet Trial. In general, the russet selections appeared to be more susceptible to seed piece breakdown than the round whites (visual observations). This would account, in part, for the substantially lower stand counts found in the russet trials. The selections B9398-2, B9399-1, and B9569-2 had the highest stand counts, which indicates improved tolerance to cold, wet soil conditions.

Approximately 80 percent of the selections in this study outyielded Belrus. The best marketable yields were obtained with B9648-9 (493 percent of Belrus), B9553-6 (400 percent), B9398-2 (395 percent), B9569-2 (365 percent), and B9596-2 (334 percent). In addition, these selections were essentially free of internal defects. The tubers of B9569-2 were uniform, longer, more blocky, and more numerous than most other selections in this trial.

The USDA Interregional russet selections included B9399-1, B9398-2, B9523-10, B9540-62, B9553-6, B9569-2, B9596-2, and B9648-9. With the exception of B9540-62, these were the highest yielding selections in the trial. While internal defects were minimal, heat sprouts were observed in B9399-1, B9540-62, and B9553-6.

#### Acknowledgement

The assistance of J. Watts, Wise Foods, Borden, Inc., Berwick, Pennsylvania, in chip color evaluation was greatly appreciated.

Virginia Table 1. Advanced round white variety trial-1983.

Selection	Stand count <sup>1/</sup>	Yield (cwt/A)		% US #1 of total	% Superior Yield <sup>2/</sup>	Spec. Grav.	Chip Color <sup>3/</sup>	Internal Int.	Defects <sup>4/</sup> HH		Tuber Ratings <sup>5/</sup> Shape Size Set	
		Total	US #1 <sup>2/</sup>								Shape	Size
B 7805-1	15.3	150 i-o <sup>6/</sup>	133 k-r	89	68	1.073		2	4		3	7
B 8091-8	13.5	146 k-o	124 l-r	85	63	1.080		0	1		3	6
B 8682-7	19.0	145 k-o	121 l-r	83	62	1.080	5.0*	0	0		4	6
B 8687-13	21.0	206 e-k	186 d-m	90	95	1.085	5.5*	0	1		3	7
B 8687-23	24.0	228 d-h	202 c-j	89	103	1.087	3.3	3	0		3	6
B 8701-12	16.8	178 f-m	153 g-p	86	78	1.082		3	1		4	8
B 8702-14	23.8	193 e-m	154 g-p	80	79	1.072	2.8	2	1		4	6
B 8702-15	21.8	167 g-m	119 m-r	71	61	1.082		0	0		3	7
B 8702-18	23.3	253 b-e	214 b-h	84	109	1.072		2	1		5	5
B 8706-7	15.5	146 k-o	129 k-r	88	66	1.073		0	2		3	7
B 8706-14	22.0	197 e-m	173 e-p	88	88	1.077		4	3		2	7
B 8724-2	24.8	303 a-c	245 a-d	81	125	1.083		4	0		3	5
B 8799-13	22.3	200 e-m	172 e-p	86	88	1.087	3.0	0	3		4	5
B 9140-32	16.8	162 h-n	143 i-q	88	73	1.092	3.8	0	0		2	8
B 9192-1	17.0	192 e-m	177 e-p	92	90	1.076		0	0		2	6
B 9224-6	14.3	133 l-o	113 p-r	85	58	1.077	4.3	2	0		2	6
B 9311-7	20.8	218 e-j	180 d-p	83	92	1.087		4	1		3	7
B 9335-3	19.3	222 e-i	187 d-m	84	95	1.079		4	7		2	6
B 9335-7	23.0	221 e-i	168 f-p	76	86	1.076		0	2		2	5
B 9335-35	23.8	208 e-k	166 f-p	80	85	1.092	3.8	1	1		3	6
B 9340-13	9.5	84 p	70 r	83	36	1.083		0	0		4	5
B 9384-4	19.3	171 g-m	137 j-q	80	70	1.081		3	0		3	7
B 9423-4	21.5	327 g	277 ab	85	141	1.068	3.5	0**	0		4	8
B 9510-5	24.3	258 a-e	226 a-f	88	115	1.081	2.8	0	0		3	5
B 9514-17	22.5	251 b-e	227 a-f	90	116	1.080	2.8	5	0		3	7
B 9528-10	19.8	203 e-l	178 d-p	88	91	1.081	2.3	5	1		2	5
B 9536-23	22.3	226 d-h	208 c-i	92	106	1.077	4.8*	1	0		2	6
B 9541-20	20.8	130 m-o	117 n-r	90	60	1.079	3.8	0	0		3	4
B 9581-10	22.5	313 ab	289 a	92	147	1.079	3.5	4	0		3	6
B 9602-12	24.0	261 a-e	236 a-e	90	120	1.073	4.0	0	0		1	6
B 9607-3	22.8	250 b-f	212 b-h	85	108	1.086	5.5	1	0		2	5
B 9638-11	24.5	295 a-d	256 a-c	87	131	1.078		0	0		2	6
B 9642-5	23.8	244 b-f	221 b-g	91	113	1.089		1**	1		2	7
B 9786-1	13.8	160 h-n	123 l-r	77	63	1.090		1	1		2	5
B 9786-20	19.8	211 e-k	178 d-p	84	91	1.084	4.0	1	0		3	6
B 9787-3	17.5	170 g-m	148 h-p	87	76	1.083		10	0		3	5
B 9792-28	14.5	133 l-o	114 o-r	86	58	1.085		0	2		3	6

Selection	Stand count <sup>1/</sup>	Yield Total	Yield (cst/A) US #12/ US #12/	% US #1 of total	% Superior Yield <sup>2/</sup>	Spec. Grav.	Chip Color <sup>3/</sup>	Internal Defects <sup>4/</sup> Int.	HH	Tuber Ratings <sup>5/</sup> Shape Size Set
WF 31-4	22.0	261 a-e	227 a-f	87	116	1.095		4	1	2 5 6
Atlantic	15.0	167 g-m	143 i-q	86	73	1.094	4.0	5	2	3 6 5
Belchip	8.8	91 no	79 qr	87	40	1.080		1	0	2 6 4
Chip belle	11.5	93 no	79 qr	85	40	1.092		0	5	4 5 5
Crystal	19.3	231 c-h	183 d-n	79	93	1.074		1	1	2 5 8
LaChipper	19.0	207 e-k	181 d-o	87	92	1.080		0	0	2 7 5
Norchipper	21.8	231 c-h	193 c-k	84	98	1.085	3.5	1	0	2 7 7
Oceanica	21.5	213 e-k	188 d-l	88	96	1.064	4.8	0**	0	2 6 6
Pungo	17.5	191 e-m	165 f-p	86	84	1.088	5.0*	0	0	3 6 6
Superior	21.3	221 e-i	196 c-k	87	100	1.072	5.3*	1	1	4 7 4

<sup>1/</sup>Final stand count taken 8 weeks after planting; perfect stand = 25 plants. Since the variation in stand count between varieties was significant (probability > F = .01), yields could not be adjusted for differences in stand count.

<sup>2/</sup>Tubers 1 7/8" - 4" in diameter.

<sup>3/</sup>1-4 = acceptable; 5 = marginal; 6-9 = unacceptably dark. \*denotes entries with 1 rating 2 6 for chips cooked 3, 7, 11, and 15 days after harvest.

<sup>4/</sup>Int. = internal discoloration; HH = hollow heart. Evaluation of 20 randomly selected tubers. \*\*denotes selection in which 10 tubers were evaluated.

<sup>5/</sup>Shape: 1 = round (spherical); 2 = most round; 3 = round to oblong; 4 = most oblong; 5 = oblong; 6 = oblong to slightly long; 7 = oblong to long; 8 = most long; 9 = long (cylindrical). Size: 1 = very small; 3 = small; 5 = medium; 7 = large; 9 = very large. Set: 1 = minimal; 3 = poor; 5 = fair; 7 = good; 9 = excellent.

<sup>6/</sup>Mean separation within column by Waller-Duncan, 5% level.



Virginia Table 2. Advanced Russet Variety Trial-1983.

Selection	Stand count <sup>1/</sup>	Yield (cwt/A)		% US #1 of total	% Belrus Yield <sup>2/</sup>	Spec. Grav.	Chip Color <sup>3/</sup>	Internal Defects <sup>4/</sup> Int.	Tuber Ratings <sup>5/</sup>	
		Total	US #1 <sup>2/</sup>						HH	Shape Size
B 9164-1	12.0	84 d-i <sup>6/</sup>	73 d-i	87	178	1.090	4.0	0 **	0	7 6
B 9391-2	6.3	53 hi	31 g-i	58	76			-	-	7 4
B 9395-25	3.0	22 i	21 i	95	51			1 **	1	6 6
B 9398-2	23.3	197 ab	162 ab	83	395	1.090		0	0	7 5
B 9399-1	22.3	143 a-g	119 b-e	83	290		4.3	1	1	7 6
B 9419-6	16.0	97 d-i	70 d-i	72	171	1.076		1	1	6 3
B 9523-10	18.7	149 a-f	119 b-e	80	290	1.071	4.8	0	0	6 6
B 9539-4	9.3	56 g-i	48 f-i	86	117	1.078		1 **	0	6 6
B 9540-62	13.0	108 b-i	91 c-h	84	222	1.076	3.5	0	0	6 3
B 9553-6	23.0	191 a-c	164 ab	86	400	1.074		0	0	6 6
B 9569-2	22.3	171 a-d	151 a-c	88	368	1.085	5.0*	0	0	7 6
B 9596-2	18.3	164 a-e	137 a-d	84	334	1.071		0	0	5 4
B 9648-9	21.7	223 a	202 a	91	493	1.075	3.8	0	0	6 6
B 9711-1	15.3	118 b-h	92 c-h	78	224	1.090		3	0	5 4
B 9713-1	21.0	87 d-i	58 e-i	68	141	1.081		0	0	7 3
B 9714-6	17.3	77 e-i	63 e-i	75	154	1.075		0	0	5 5
B 9717-14	14.0	105 c-i	91 c-i	82	222	1.072		0	0	5 5
B 9718-7	12.0	98 d-i	76 d-i	78	185	1.086	4.0	0 **	0	6 6
B 9724-15	11.0	54 g-i	40 g-i	74	98	1.077		2	2	5 4
B 9729-2	10.0	59 g-i	48 f-i	81	117	1.078		1	0	6 5
B 9733-2	7.3	49 hi	36 g-i	73	88	1.079		2 **	1	4 2
B 9734-3	7.7	47 hi	26 hi	53	63	1.072		3 **	0	5 4
B 9735-6	19.0	69 f-i	40 g-i	58	98	1.086		1 **	1	6 6
B 9738-2	17.7	113 b-h	79 d-i	70	193	1.082		0	0	6 6
B 9740-1	7.3	55 g-i	46 f-i	84	112	1.073		0	2	7 3
B 9750-1	16.0	115 b-h	75 d-i	65	183	1.078		0	1	6 6
B 9758-1	9.3	74 f-i	63 e-i	85	154	1.077		0	0	6 6
B 9762-7	16.3	122 b-h	97 b-g	80	237	1.102		0 **	0	6 6
B 9762-11	20.3	114 b-h	98 b-g	86	278	1.092		1	0	6 6
B 9767-20	18.3	107 c-i	68 d-i	64	166	1.084		2	0	6 6
Belrus	12.0	55 g-i	41 g-i	75	100	1.086		1 **	0	4 4
Centennial	16.0	87 d-i	61 e-i	70	149	1.079		0	0	5 4
Goldrus	15.3	135 a-h	114 b-f	84	278	1.084		0	0	7 6
Lemhi	7.3	69 f-i	59 e-i	85	144	1.076		0	0	7 5
Norgold Russet	12.3	110 b-i	73 d-i	66	178	1.071		1	0	6 6
Russet Burbank	12.3	135 a-h	99 b-g	73	241	1.080		4	0	3 6

<sup>1/</sup> - <sup>6/</sup> See appropriate footnotes, Table 1.

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Developing,  
Identifying and  
Evaluating Disease,  
Pest and Stress  
Resistant Potato  
Germplasm

A USDA potato germplasm enhancement program is being conducted at Prosser, Washington, and Aberdeen, Idaho. It is integrated and interfaces with cultivar development and evaluation programs being conducted by state agencies in most western states. Its primary goal is to find or synthesize gene combinations or "packages" which can solve the disease, pest and stress problems associated with potato culture in the West and other places in the U.S. and world. These resistances are then combined with adaptability, production, quality, handling, storability and processing characteristics needed in commercial cultivars. As potential breeding parents emerge from this germplasm enhancement effort they are evaluated for crossability and combining ability and progeny tested to prove their value as breeding parents. Those showing promise are rendered disease-free by heat therapy and meristem culturing, maintained in an axenic test tube culture repository and distributed as pathogen-tested-free plantlets to breeders desiring to use them.

In 1983, many thousands of first and second generation clones were screened under severe disease, pest and stress exposures as single hills from greenhouse-grown seedling tubers or by direct seeding true potato seed (TPS) directly into disease nurseries or producing transplants from TPS and transplanting them to such nurseries. Five large disease nurseries were conducted at Prosser, designed to provide severe exposure to either Verticillium wilt, leafroll virus, PVY virus, Columbia root-knot nematode or deep-pitted scab, the five most important diseases or pests in the Northwest.

In addition to the early generation screening above, we also obtained germplasm and early and advanced generation breeding lines from other breeding programs throughout the United States and worldwide. Over 800 of these lines were also evaluated in the five nurseries, to develop disease resistance profiles and observe horticultural characteristics and seedball production.

To assess the response of these early generation progenies and breeding lines to environmental stresses, most trials were subjected to over-irrigation during early tuber growth to encourage expression of weaknesses to internal tuber problems such as hollow heart. At the time of maximum tuber bulking irrigation was interrupted for two weeks to encourage expression of weaknesses to external tuber problems such as malformations and growth cracking.



Several promising lines were planted in two commercial growers' fields under center-pivot irrigation. Circles were chosen which had a history of deep-pitted scab and severe early-dying from a combination of Verticillium and Sclerotinia wilts and early blight.

Resistance,  
Horticultural and  
Seedball Character-  
istics of Promising  
Germplasm

All characteristics were rated on a 1 to 5 scale with 1 being very susceptible or very poor and 5 being very resistant or very good. None of the characteristics evaluated could be rated on a plus or minus scale, all had many intermediate ratings that ranged from 1 to 5. An average was computed for the 3 or 4 replications in each trial and, in many cases, several trials and several years. An average of 1 to 1.6 was considered very susceptible (VS) or very poor, 1.7 to 2.3 as susceptible (S), 2.4 to 3.0 as moderately susceptible (MS), 3.1 to 3.7 as moderately resistant (MR), 3.8 to 4.4 as resistant (R), and 4.5 to 5.0 as very resistant (VR) or very good.

Disease resistance profiles are shown for the 1983 entries in the Western Regional Trials (Table 1) and for a number of other breeding lines which were selected because of their horticultural potential (Tables 4 and 5). The horticultural performance of these latter lines, previously selected because of fresh market and processing potential, is shown in Tables 2 and 3. Although several of the lines are interesting for one or more superior characteristic, none appear to be the multi-disease resistant, high-yielding, good quality genotype that is needed by the industry. Several should be useful as the breeding parents needed to produce such a cultivar.

Multi-Disease  
Resistant Gene  
Packages Now  
Available for  
Distribution from  
the Prosser  
Repository

For the past four years our best multi-disease resistant clones or "gene packages" have been rendered pathogen-tested-free by heat therapy and meristem culture. These are disease indexed and maintained in axenic test tube cultures, ready for distribution as plantlets to anyone interested in their use as breeding parents. The disease response profiles of those available in the repository are shown in Table 6 and those currently being added are shown in Table 7. Also shown is the average overall horticultural rating, tuber type, seedball set, etc. for each line. Anyone interested in receiving plantlets of any of these lines can obtain them by writing to Carla Farrell, IAREC, P.O. Box 30, Prosser, WA 99350. A few weeks will be required to establish sub-plantlets from the mother plantlet and mail them to you.

Washington Table 1. Disease resistance profile of regional trial entries, as determined in disease nurseries conducted near Prosser, WA during 1981 to 1983.

Line	Scab	Vert <sup>1</sup> / <sub>CS2</sub>	E. Die	PVY	CS	PLRV	Nema	Hort	Type	Other
A69870-3	<u>4.63</u> (5)	<u>4.0</u> (10)	<u>3.4</u> (32)	<u>4</u> / <sub>+</sub>	+	++	3.2 (4)	2.8 (28)	Lg rus <sup>5</sup> / <sub>6</sub>	
A72685-2	<u>2.9</u> (22)	2.8 (26)	2.9 (22)	++	++	++	<u>3.3</u> (8)	3.1 (59)	Lg rus	Res. Scl
A74133-1	<u>5.0</u> (2)	<u>3.2</u> (10)	<u>3.1</u> (20)	+	++	?	---	2.4 (19)	Ob1 rus	M. sdb1
A74212-1	<u>4.0</u> (2)	2.7 (11)	2.6 (13)	++	++	?	<u>3.5</u> (4)	2.9 (15)	Lg rus	M. sdb1
A75188-3	<u>4.7</u> (6)	<u>3.6</u> (9)	<u>3.2</u> (17)	++	++	++	3.3 (6)	2.4 (27)	Lg rus	Res EB, Scl M. sdb1
NDD47-1	2.4 (8)	<u>3.5</u> (21)	2.3 (8)	++	++	++	3.1 (5)	2.9 (49)	Ob1 buf	Res PM M. sdb1
R. Burbank	<u>4.2</u> (124)	1.9 (60)	2.1 (47)	+	++	++	2.3 (10)	2.6 (103)	Lg rus	

1/Abbreviations in heading: Vert = Verticillium wilt; E. Die = Early dying from early maturity, early blight, Sclerotinia wilt, powdery mildew and Verticillium wilt combined; PVY = potato virus Y; PLRV = potato leafroll virus; Nema = Columbia root-knot nematode; Hort = overall rating based on visual observation of tubers at harvest; Type = shape and russetting of tubers; Other = other valuable attributes.

2/CS = current season symptoms, Chr = chronic symptoms, Net = net necrosis.

3/Disease resistance on 1-5 scale as expressed in field disease nurseries designed to provide severe exposure; 1 = very susceptible, 5 = very resistant. Number in parenthesis = number of reps that have been rated. Hort attributes rated on 1-5 scale with 1 = very poor, 5 = very good.

4/<sub>+</sub> = mild symptoms, ++ = severe symptoms

5/Lg = long, obl = oblong, rus = russet, buf = buff colored.

6/Res = resistant, Scl = Sclerotinia wilt, M = many, sdb1 = seedball, EB = Early blight, PM = powdery mildew.

Washington Table 2. Results of performance trial of processing lines conducted at Umatilla, Oregon in 1983.

Line	Total cwt/A	U.S. No. cwt/A	l's %	l's %	l's > 10 oz cwt/A	Nr. Tubers	% Okay External	% Okay Internal	HH	BC	Vas Nec	IBS	Blsp	Sp. Gr. 1.0--
A 7822-3	624 <sup>1/</sup> A <sup>2/</sup>	528 A	85 AB	277 A	145 A-C	94 AB	98 A	0	0	0	2	0	0	84 B-D
ND 534-4	621 A	504 AB	81 B	172 BC	189 A	97 A	95 AB	0	0	0	3	0	2	71 E
NDA 1235-2	609 AB	523 AB	85 AB	187 BC	163 A-C	95 AB	48 DE	0	3	47	0	0	2	82 CD
R. Burbank	578 AB	362 BC	63 E	65 EF	194 A	91 B	30 E	30	36	8	0	0	1	83 B-D
Shepody	514 A-C	412 A-C	80 BC	215 AB	120 BC	94 AB	48 DE	3	4	45	0	0	0	80 D
A 7596-1	514 A-C	371 A-C	73 D	132 C-E	114 BC	83 C	71 B-D	1	4	23	1	1	1	88 B
WnC 521-12	477 A-C	403 A-C	87 AB	150 BC	144 A-C	96 A	90 AB	0	0	10	0	0	0	98 A
Lemhi	445 BC	371 A-C	83 AB	138 CD	125 BC	95 AB	87 A-C	1	0	6	0	0	8	86 BC
LC-1	442 BC	371 A-C	84 AB	136 C-E	126 BC	98 A	53 DE	0	1	46	0	0	0	83 B-D
78 Ds-300	372 C	277 C	75 CD	28 F	175 AB	99 A	83 A-C	3	5	9	3	3	5	96 A
Nooksack	360 C	301 C	89 A	68 D-F	102 C	91 B	60 C-E	0	0	39	0	0	1	88 BC

<sup>1/</sup> Average yield from 3 reps of 20 hills each. Planted April 27, harvested August 22 - 117 days growing season - early harvest for us.

<sup>2/</sup> Varieties not having a letter in common are significantly different at 5% level according to Duncan's MR test.

Washington Table 3. Results of performance trial of fresh market (or processing) lines conducted at Umatilla, Oregon in 1983.

Line	Total cwt/A	U.S No. 1's cwt/A	% 1's	1's cwt/A	10 oz cwt/A	Nr. Tubers	% Okay External	% Okay Internal	HH	BC	Vas Nec	IBS	Blsp	Sp. Gr. 1.0--					
A72685-2	643 <sup>1/</sup>	A <sup>2/</sup>	89	A	206	A	161	BC	97	A	83	A-E	0	0	2	15	0	92	A-C
NDA1309-5	560	AB	76	A-G	150	A-D	160	BC	94	A-D	85	A-E	0	10	15	0	0	91	A-C
ND534-4	544	A-C	88	A-B	101	C-I	165	BC	98	A	87	A-D	0	2	10	2	2	69	NO
A73400-3	526	A-D	57	G-I	9	K	242	A	99	A	83	A-E	0	0	17	3	2	94	AB
A7827-9	516	A-E	86	A-C	111	B-H	149	B-D	96	AB	88	A-C	0	8	2	0	2	81	H-M
A7836-7	507	A-F	81	A-F	150	A-D	140	B-E	95	A-C	75	A-E	15	0	15	0	0	84	E-J
R. Burbank	489	A-F	61	E-I	55	F-K	161	BC	87	E	12	G	38	48	27	0	0	81	H-M
A7865-19	489	A-F	66	A-H	53	F-K	188	B	89	DE	75	A-E	0	0	17	8	0	84	D-J
A7816-14	473	B-F	78	A-G	150	A-D	125	C-G	95	A-D	78	A-E	0	0	22	0	0	94	A
A78102-5	473	B-F	84	A-E	194	AB	109	C-I	93	A-E	93	AB	2	0	7	2	-0	67	0
ND388-1	458	B-F	89	A	65	D-K	137	B-F	98	A	60	B-F	12	10	30	5	0	84	D-J
Wb630-5	440	B-F	77	A-G	145	A-E	88	E-I	96	AB	88	A-C	0	0	10	2	0	83	E-K
Russette	436	B-F	77	A-G	101	C-I	117	C-I	89	C-E	90	A-C	0	0	8	0	3	91	A-D
A78242-4	424	B-F	86	AB	113	B-H	111	C-I	96	AB	70	A-F	2	3	28	0	3	80	I-M
A78243-1	412	B-F	81	A-F	163	A-C	110	C-I	96	AB	87	A-D	2	0	13	0	0	91	A-C
A7854-6	408	B-F	76	A-G	99	C-J	117	C-I	95	A-D	50	EF	22	27	12	0	0	79	I-M
LC-1	403	B-F	75	A-G	95	C-K	118	C-I	93	A-E	85	A-E	0	0	15	0	0	77	K-M
WbC630-2	387	C-F	85	A-D	83	C-K	116	C-I	99	A	100	A	0	0	0	0	0	82	F-K
A77311-1	381	C-F	71	A-H	58	F-K	139	B-F	95	A-D	85	A-E	0	4	12	0	2	82	F-K
Norgold	372	D-F	69	A-H	55	F-K	132	C-G	95	A-C	68	A-F	23	0	7	0	2	75	L-N
A7815-7	366	D-F	63	C-I	65	D-K	140	B-E	98	A	100	A	0	0	0	0	0	81	G-L
A7873-1	362	D-F	88	A	135	A-F	90	E-I	96	AB	95	AB	0	3	2	0	0	91	A-C
A78100-7	357	D-F	75	A-G	62	E-K	132	C-G	94	A-D	55	C-F	15	23	10	3	0	88	B-G
A7858-7	350	EF	67	A-H	43	H-K	126	C-G	91	B-E	52	D-F	2	0	7	43	2	83	F-K
Nooksack	348	EF	88	A	95	C-K	98	E-I	98	A	60	B-F	0	0	40	2	0	90	A-D
A7836-30	344	EF	86	AB	132	A-G	88	E-I	98	A	88	A-C	3	3	5	0	2	82	F-K
Bel Rus	341	F	286	D-J	67	D-K	108	C-I	100	A	82	A-E	0	0	15	0	3	90	A-E
A7836-15	325	G-M	228	F-K	53	F-K	131	C-G	98	A	84	A-E	2	0	16	4	2	79	JM
A7881-8	320	G-M	69	A-H	67	D-K	113	C-I	95	A-C	88	A-C	0	0	10	2	0	88	A-F
A7856-6	316	G-M	258	E-K	28	H-K	103	D-I	97	A	72	A-F	3	13	20	3	0	75	MN
A78239-1	252	H-N	150	H-L	12	JK	115	C-I	98	A	88	A-C	0	0	12	0	0	89	A-E
A7836-28	249	H-N	145	I-L	46	G-K	113	C-I	96	A-C	95	AB	0	0	3	3	0	77	K-M
A78100-11	233	I-N	182	G-L	111	B-H	61	I	96	AB	58	B-F	15	0	30	5	0	86	C-I
ND14-1	224	J-N	145	I-L	18	I-K	83	F-I	93	A-D	93	AB	0	0	7	0	0	66	0
A7896-7	194	K-N	141	J-L	18	I-K	78	G-I	99	A	50	C-F	0	0	15	41	0	83	F-K
A7869-20	182	L-N	138	J-L	9	K	68	HI	96	A-C	90	A-C	0	0	10	0	0	79	J-M
A7817-1	169	MN	111	KL	34	H-K	76	G-I	98	A	80	A-E	7	0	16	0	0	87	C-H
A7847-7	150	N	65	L	12	JK	91	E-I	98	A	54	C-F	13	33	0	0	0	71	NO

1/ Average yield from 3 reps of 20 hills each. Planted April 27, harvested August 22 - 117 days growing season - early harvest for us.

2/ Varieties not having a letter in common are significantly different at 5% level according to Duncan's MR test.

Washington Table 4. Disease resistance profiles of lines entered in 1983 processing performance trial, as determined in disease nurseries conducted near Prosser, WA during 1977 to 1983.

83 Acc.	Line	Scab	Vert <sup>1/</sup>	E. Die	CS <sup>2/</sup>	Chr	CS	PLRV Net	Chr	Nema	Hort	Type	Other
527	A7822-3	2.4 <sup>3/</sup> (9)	2.9 (4)	2.4 (12)	4/ ++	++	0	?	0	5.0 (1)	2.6 (16)	Lg wh <sup>5/</sup>	Res.Scl, M.Sdbl
782	ND534-4	3.0 (13)	1.0 (3)	1.7 (16)	+?	++	++	?	++	3.0 (5)	4.1 (21)	Lg rus	V. det
790	NDA1235-2	1.4 (7)	1.0 (1)	2.6 (10)	+	+	+	?	+	?	2.9 (13)	Rnd wh	F.Sdbl, det
1	R. Burbank	4.0 (131)	1.9 (60)	2.1 (47)	++	++	++	++	++	2.3 (10)	2.6 (103)	Lg rus	
17	Shepody	1.9 (6)	3.0 (3)	1.9 (8)	++	?	++	?	++	1.7 (3)	3.0 (13)	Lg wh	
486	A7596-1	4.8 (12)	4.1 (18)	3.2 (23)	++	++	++	++	++	2.8 (4)	2.7 (40)	Lg rus	Res.Scl, F.Sdbl
107	WnC521-12	2.3 (12)	2.5 (16)	2.7 (11)	++	++	++	+	++	3.2 (5)	3.3 (44)	Obl wh	M.Sdbl
8	Lenhi	4.7 (73)	2.1 (43)	2.3 (18)	++	++	++	+?	++	2.0 (3)	3.6 (187)	Lg rus	F.Sdbl
4	LC-1	4.5 (22)	1.1 (9)	1.7 (31)	+?	++	+	+?	++	2.3 (3)	3.3 (53)	Lg rus	V.det, M.Sdbl
216	78Ds-300	2.6 (9)	4.2 (12)	3.8 (20)	++	+	+	?	++	3.5 (4)	2.8 (34)	Obl buf	Res.Scl, M.Sdbl
5	Nooksack	4.6 (76)	2.5 (40)	2.7 (25)	0?	+?	+	++	+	2.9 (11)	3.4 (155)	Lg rus	M.Sdbl, det

1/ Abbreviations in heading: Vert = Verticillium wilt; E. Die = Early dying from early maturity, early blight, Sclerotinia wilt, powdery mildew and Verticillium wilt combined; PVY = potato virus Y; PLRV = potato leafroll virus; Nema = Columbia root-knot nematode; Hort = overall rating based on visual observation of tubers at harvest; Type = shape and russetting of tubers; Other = other valuable attributes.

2/ CS = current season symptoms, Chr = chronic symptoms, Net = net necrosis.

3/ Disease resistance on 1-5 scale 0 = no symptoms, 1 = very susceptible, 5 = very resistant. Number in parenthesis = number of reps that have been rated. Hort attributes rated on 1-5 scale with 1 = very poor, 5 = very good.

4/ + = mild symptoms, ++ = severe symptoms, 0 = no symptoms, ? alone = not adequately evaluated yet.

5/ Lg = long, obl = oblong, Rnd = round, rus = russet, buf = buff colored, wh = white.

6/ Res = resistant, Scl = Sclerotinia wilt, M = many, F = few, sdbl = seedball, EB = Early blight, V. det = very determinant plant.



Washington Table 5. Disease resistance profiles of lines entered in 1983 fresh market performance trial, as determined in disease nurseries conducted near Prosser, WA during 1977 to 1983.

83 Acc.	Line	Scab	Vert- <sup>1/</sup>	E. Die	CS <sup>2/</sup> PVY	Chr	CS	PLRV Net	Chr	Nema	Hort	Type	Other
1	R. Burbank	4.0 <sup>3/</sup> (131)	1.9 (60)	2.1 (47)	++ <sup>4/</sup>	++	++	++	++	2.3 (10)	2.6 (163)	Lg rus <sup>5/</sup>	6/ V.det
2	Norgold	4.5 (91)	1.1 (21)	1.2 (26)	++	++	++	++	++	3.6 (9)	2.9 (165)	Obl rus	M.Sdbl, V.det
4	LC-1	4.5 (22)	1.1 (9)	1.7 (31)	++	++	+	++	++	2.3 (3)	3.3 (53)	Lg rus	M.Sdbl, V.det
5	Nooksack	4.6 (76)	2.5 (40)	2.7 (25)	0?	++	++	++	++	2.9 (11)	3.4 (155)	Lg rus	M.Sdbl, det
9	Russette	2.9 (36)	2.3 (15)	2.6 (11)	++	++	++	++	++	2.8 (4)	3.0 (77)	Obl rus	M.Sdbl, det
10	Bel Rus	2.0 (16)	1.5 (14)	1.7 (20)	++	+	++	0?	0?	3.0 (3)	2.6 (42)	Lg rus	V.det
112	WnC630-2	3.3 (9)	2.0 (7)	2.5 (24)	+	+	++	?	+	2.9 (6)	2.8 (25)	Lg rus	M.Sdbl, det
113	WnC30-5	2.9 (33)	2.9 (18)	2.7 (11)	++	++	++	++	+	1.5 (4)	3.8 (70)	Lg wh	M.Sdbl, det
469	A72685-2	3.0 (25)	2.8 (26)	2.9 (22)	++	++	+	++	++	3.3 (8)	3.2 (54)	Lg rus	EB, Scl.res
471	A73400-3	4.2 (5)	2.1 (6)	2.5 (16)	+	++	+	++	++	1.7 (3)	2.2 (21)	Obl rus	Scl.res, det?
508	A77311-1	2.7 (10)	2.5 (4)	3.1 (11)	0	++	++	?	++	?	2.6 (16)	Lg rus	Scl.res, M.Sdbl det
524	A7815-7	3.9 (7)	2.6 (5)	2.2 (9)	++	++	+	?	++	?	2.6 (14)	Lg rus	M.Sdbl, det
525	A7816-14	5.0 (6)	2.3 (4)	2.5 (10)	++	++	++	?	+	?	2.7 (13)	Lg rus	F.Sdbl
526	A7817-1	4.7 (7)	2.0 (1)	2.1 (12)	+	+	++	?	++	?	2.0 (12)	Lg rus	V.det
528	A7827-9	5.0 (5)	2.0 (1)	1.8 (8)	+	+	++	?	++	?	3.4 (9)	Lg rus	F.Sdbl, det
529	A7836-7	3.6 (5)	2.0 (1)	1.9 (9)	++	++	++	?	+	?	2.7 (10)	Obl rus	Det
530	A7836-15	3.8 (6)	2.4 (4)	2.5 (6)	++	++	++	?	++	?	2.1 (11)	Obl rus	Scl.res, det
531	A7836-28	4.9 (7)	2.5 (4)	2.3 (11)	++	++	+	?	+	?	1.9 (17)	Lg rus	Det
532	A7836-30	3.4 (7)	1.8 (4)	2.5 (6)	++	++	++	?	++	?	2.8 (12)	Lg rus	V.det
533	A7847-7	4.4 (7)	1.0 (1)	1.3 (11)	++	++	++	?	++	?	2.3 (13)	Obl rus	V.det
534	A7854-6	3.9 (7)	2.0 (4)	1.8 (12)	++	++	+	?	+	3.0 (2)	2.8 (16)	Lg buf	F.Sdbl, det
535	A7856-6	3.6 (8)	2.0 (1)	2.5 (14)	+	+	+	?	++	3.5 (2)	3.1 (13)	Lg rus	M.Sdbl, det
536	A7858-7	2.4 (7)	2.0 (3)	2.3 (16)	+	++	++	?	++	2.3 (3)	2.5 (17)	Lg rus	Scl.res, V.det
537	A7865-19	2.4 (7)	1.8 (4)	2.4 (7)	++	++	++	?	++	?	2.2 (14)	Lg buf	Scl.res, F.Sdbl
541	A7869-20	3.7 (6)	2.0 (4)	2.6 (7)	++	++	++	?	++	?	2.4 (13)	Lg rus	V.det
543	A7873-1	2.6 (5)	3.3 (4)	3.4 (11)	+	++	+	?	+	?	3.4 (13)	Obl lt rus	Scl.res
544	A7881-8	4.8 (6)	1.0 (1)	1.8 (12)	+	+	++	?	++	3.5 (2)	2.9 (11)	Lg rus	F.Sdbl, V.det
545	A7896-7	4.8 (6)	2.5 (4)	2.6 (12)	++	++	++	?	++	4.5 (2)	2.4 (14)	Lg lt rus	V.det
546	A78100-7	4.5 (6)	2.3 (4)	2.8 (14)	++	++	++	?	++	4.0 (3)	2.7 (16)	Lg rus	Scl.res, M.Sdbl
547	A78100-11	2.0 (7)	2.0 (4)	2.2 (13)	++	++	+	?	++	3.5 (2)	3.1 (15)	Lg rus	F.Sdbl, V.det
548	A78102-5	5.0 (3)	2.0 (3)	2.6 (12)	++	++	0?	?	0?	4.5 (2)	2.9 (15)	Lg rus	Scl.res, M.Sdbl det
551	A78239-1	3.2 (9)	2.0 (4)	2.6 (11)	++	++	++	?	++	?	2.8 (16)	Lg buf	M.Sdbl, det



Washington Table 5 (continued)

83 Acc.	Line	Scab	Vert <sup>1/</sup>	E. Die	CS <sup>2/</sup>	PVY Chr	CS	PLRV Net	Chr	Nema	Hort	Type	Other
552	A78242-4	3.7 (7)	2.0 (1)	3.2 (10)	++	++	0	?	++	?	2.7 (12)	Lg rus	M.Sdbl, Scl.res det
553	A78243-1	3.6 (7)	1.5 (4)	2.6 (11)	+	++	++	?	++	?	3.1 (15)	Lg rus	Scl.res, M.Sdbl
775	ND14-1	3.4 (10)	1.4 (13)	1.4 (24)	+	+	++	+	++	3.9 (9)	2.4 (42)	Lg rus	M.Sdbl, V.det
780	ND388-1	4.8 (5)	1.5 (2)	1.9 (14)	+	++	+	++	+	1.3 (3)	3.0 (21)	Lg rus	V.det
782	ND 534-4	3.0 (13)	1.0 (3)	1.7 (16)	++	++	++	?	++	3.0 (5)	4.1 (21)	Lg rus	V.det
791	ND1309-5	2.8 (4)	1.0 (1)	2.8 (8)	++	++	++	?	++	?	3.2 (9)	Lg rus	Scl.res, det

1/ Abbreviations in heading: Vert = Verticillium wilt; E. Die = Early dying from early maturity, early blight, Sclerotinia wilt, powdery mildew and Verticillium wilt combined; PVY = potato virus Y; PLRV = potato leafroll virus; Nema = Columbia root-knot nematode; Hort = overall rating based on visual observation of tubers at harvest; Type = shape and russetting of tubers; Other = other valuable attributes.

2/ CS = current season symptoms, Chr = chronic symptoms, Net = Net necrosis.

3/ Disease resistance on 1-5 scale as expressed in field disease nurseries designed to provide severe exposure; 1 = very susceptible, 5 = very resistant. Number in parenthesis = number of reps that have been rated. Hort attributes rated on 1-5 scale with 1 = very poor, 5 = very good.

4/ + = mild symptoms, ++ = severe symptoms, 0 = no symptoms, ? alone = not adequately evaluated yet.

5/ Lg = long, obl = oblong, rus = russet, buf = buff colored.

6/ Res = resistant, Scl = Sclerotinia wilt, M = many, F = few, Sdbl = seedball, EB = Early blight, V. det = very determinant plant.

Washington Table 6. Disease resistance profiles of lines available in Prosser Meristem Repository, as determined in disease nurseries conducted near Prosser, Washington during 1977 to 1983.

83 Acc.	Identity	Scab	Vert- <sup>1/</sup>	E. Die	CS- <sup>2/</sup> PVY	Chr	CS	PLRV Net	Chr	Nema	Hort	Type	Other
4	LC-1	VR <sup>3/</sup>	VS	S	MR	S	MS	MR	S	S	4/ 3.3 (53)	Lg rus	6/ V.Det., M.Sdbl
5	Nooksack	VR	MS	MS	R	MS	MS	S	MS	MS	3.4 (155)	Lg rus	Det., M.Sdbl
8	Lemhi	VR	S	S	S	S	S	MR	S	S	3.6 (187)	Lg rus	F.Sdbl
9	Russette	MS	S	MS	MR	S	S	MR	S	MS	3.0 (77)	Obl rus	Det., M.Sdbl
10	Bel Rus	S	VS	S	MS	MS	R	R	R	MS	2.6 (42)	Lg rus	V.Det
14	Cascade	MS	S	S	S	S	MR	R	S	S	3.3 (72)	Obl wh	Det
34	Alpha	R	MS	MR	VS	VS	MR	MR	S	MS	2.2 (13)	Obl wh	
35	Katahdin	S	MR	R	R	MS	MS	S	S	MR	3.3 (20)	Rnd wh	M.Sdbl
100	WnC 245-2	R	VS	VS	VS	VS	S	S	S	VS	2.4 (13)	Lg rus	F.Sdbl, V.Det
102	WnC 316-1 Bel	MR	VS	S	VS	VS	MS	MS	MS	S	3.2 (143)	Lg rus	M.Sdbl, V.Det
104	WnC 330-1 Cl	VR	VS	VS	S	S	S	MR	S	MS	2.7 (114)	Lg rus	F.Sdbl, V.Det
105	WnC 330-1 Can	R	VS	S	VS	VS	MR	MR	MR	MS	2.7 (17)	Lg rus	M.Sdbl, Det
107	WnC 521-12	MS	MS	MS	S	S	S	MS	S	MR	3.3 (44)	Obl wh	M.Sdbl
110	WnC 612-13	MS	R	MR	S	VS	VS	R	VS	S	3.7 (60)	Obl buf	F.Sdbl, ResScl,
111	WnC 618-21 Lrg	R	MR	R	MS	MS	VS	MS	VS	S	2.7 (72)	Lg rus	Det, EB, PM
112	WnC 630-2	MR	S	MS	MS	MS	MS	S	MS	MS	2.8 (25)	Lg rus	ResScl, EB, PM
113	Wn 630-5	MS	MS	MS	MS	S	S	MR	MS	VS	3.8 (70)	Lg wh	Det., M.Sdbl
114	WnD 641-10	R	S	VS	S	S	S	S	S	MS	3.4 (16)	Lg rus	Det., M.Sdbl
115	Wn 670-20	VR	MR	MS	S	VS	VS	S	S	S	2.6 (30)	Lg rus	Det, F.Sdbl,
116	Wn 705-13	S	MR	MR	MR	S	MR	S	S	MS	3.0 (73)	Lg wh	Res.EB, PM
117	Wn 705-57	MS	MR	MR	S	S	S	MR	S	S	3.0 (66)	Obl buf	F.Sdbl, PM
118	Wn 705-60	S	VS	VS	VS	VS	VS	VS	VS	VS	2.3 (30)	Obl wh	Res.Scl, Res.Scl,
119	Wn 705-64	S	MR	R	S	MS	MR	VS	MS	S	2.9 (104)	Obl buf	EB, PM
120	Wn 705-111	S	MR	R	MR	MS	MR	S	MS	MR	3.2 (108)	Obl wh	M.Sdbl, Res.Scl,
121	Wn 705-113	VS	MR	R	VS	VS	MR	MR	MR	S	2.6 (42)	Obl buf	EB, PM
122	Wn 705-114	MR	R	R	VS	VS	S	S	S	MR	2.9 (27)	Lg buf	Res.Scl, Res.Scl,
124	Wn 705-250	S	R	R	VS	VS	MS	MR	MR	VS	2.9 (21)	Obl wh	Res.EB, PM
125	Wn 705-381	VS	R	R	VS	VS	VS	VS	S	S	2.3 (16)	Obl buf	Res.PM

Washington Table 6. (continued)

83 Acc.	Identity	Scab	Vert- <sup>1/</sup>	E. Die	CS <sup>2/</sup>	PVY	Chr	CS	PLRV Net	Chr	Nema	Hort	Type	Other
126	Wn 705-413	<u>S<sup>3/</sup></u>	<u>R</u>	<u>MR</u>	VS	VS	VS	MR	MR	VS	MS	<u>4/</u>	<u>5/</u>	<u>6/</u>
127	Wn 705-495	<u>MR</u>	<u>MR</u>	<u>R</u>	S	S	MS	MS	MS	MS	VS	1.9 (14)	Rnd wh	<u>Res.EB, PM</u>
128	Wn 705-513	VS	MS	MS	MS	MS	MS	VS	VS	MS	MS	2.9 (28)	Ob1 lt	<u>Det. Res.EB, PM</u>
130	Wn 706-26	MS	<u>MR</u>	<u>MR</u>	VS	VS	VS	MR	MR	MS	MS	3.5 (14)	Rnd buf	F.Sdbl
131	Wn 708-6	MS	<u>VS</u>	<u>VS</u>	S	S	VS	<u>R</u>	<u>R</u>	MR	MS	<u>3.1 (82)</u>	Ob1 buf	<u>Res.Sc1, PM</u>
132	Wn 708-27	S	<u>MR</u>	<u>MR</u>	VS	VS	VS	VS	VS	VS	<u>R</u>	<u>2.2 (21)</u>	Ob1 rus	<u>M.Sdbl, V.Det</u>
133	Wn 720-50	VS	<u>VR</u>	<u>VR</u>	<u>MR</u>	<u>MR</u>	<u>MR</u>	S	S	VS	<u>MR</u>	<u>3.5 (87)</u>	Ob1 buf	<u>F.Sdbl, Res.Sc1,</u> <u>EB, PM</u>
134	Wn 726-3	S	<u>MR</u>	<u>R</u>	VS	VS	VS	<u>MR</u>	<u>MR</u>	<u>R</u>	<u>R</u>	2.6 (19)	Lg buf	<u>M.Sdbl, Res.EB,</u> <u>PM</u>
135	Wn 775-26	<u>R</u>	S	MS	VS	VS	VS	S	S	S	<u>R</u>	2.3 (41)	Lg lt	<u>Det, Res.Sc1,</u> <u>EB, PM</u>
201	76 Ds-2	VS	<u>MR</u>	<u>MR</u>	VS	VS	VS	<u>MR</u>	<u>R</u>	<u>MR</u>	--	3.1 (36)	Lg rus	<u>F.Sdbl</u>
202	77 Ds-18	MS	<u>R</u>	<u>R</u>	VS	VS	MS	<u>VS</u>	<u>S</u>	<u>VS</u>	MS	<u>2.7 (40)</u>	Lg rus	<u>Det.</u>
203	77 Ds-39	<u>VR</u>	<u>R</u>	<u>VS</u>	VS	VS	VS	<u>MR</u>	<u>MR</u>	<u>MS</u>	<u>R</u>	1.7 (17)	Rnd wh	<u>F.Sdbl</u>
204	77 Ds-50	<u>MR</u>	<u>MR</u>	<u>MR</u>	VS	VS	S	<u>S</u>	S	S	<u>R</u>	2.5 (31)	Ob1 rus	<u>V.Det.</u>
205	78 Ds-3	<u>R</u>	<u>MR</u>	<u>MR</u>	S	S	S	<u>MR</u>	<u>MR</u>	<u>MS</u>	<u>MR</u>	1.7 (15)	Lg wh	<u>M.Sdbl, Res.Sc1,</u> <u>EB</u>
211	78 Ds-30	MS	<u>MR</u>	<u>MS</u>	MS	MS	MR	<u>MR</u>	<u>MR</u>	S	<u>MR</u>	1.7 (15)	Rnd wh	<u>M.Sdbl</u>
212	78 Ds-32	MS	<u>R</u>	<u>R</u>	MS	MS	MS	<u>MR</u>	<u>R</u>	<u>R</u>	<u>MR</u>	2.8 (13)	Lg wh	<u>M.Sdbl</u>
214A	78 Ds-99 (dupl)	S	S	S	<u>R</u>	<u>R</u>	MS	VS	<u>R</u>	<u>VS</u>	<u>S</u>	1.8 (22)	Ob1 wh	<u>F.Sdbl</u>
216	78 Ds-300	MS	<u>R</u>	<u>R</u>	MS	MS	<u>MR</u>	S	<u>MR</u>	S	MS	2.7 (22)	Ob1 wh	<u>F.Sdbl</u>
227	79 Ds500A-42	S	<u>MR</u>	<u>MR</u>	MS	MS	<u>MR</u>	VS	<u>MR</u>	VS	MS	2.8 (34)	Ob1 wh	<u>M.Sdbl, Res.Sc1</u>
229	79 Ds504-11	<u>R</u>	<u>VR</u>	<u>VR</u>	<u>VR</u>	<u>VR</u>	<u>VR</u>	VS	<u>VS</u>	VS	<u>MR</u>	2.2 (15)	Ob1 wh	<u>F.Sdbl</u>
238A	80 Ds Br-8	<u>R</u>	<u>R</u>	<u>VR</u>	S	S	<u>S</u>	VS	<u>VS</u>	VS	<u>MR</u>	2.4 (15)	Lg wh	<u>F.Sdbl</u>
250	80 Ds-39	MS	<u>R</u>	<u>R</u>	S	S	S	VS	VS	VS	--	1.5 (2)	Rnd wh	<u>M.Sdbl</u>
254	80 Ds-147	<u>VR</u>	<u>R</u>	<u>VR</u>	S	S	S	VS	VS	VS	--	2.2 (6)	Lg wh	<u>Det., Res.EB</u>
412	A 7273-3	<u>R</u>	<u>VR</u>	<u>VR</u>	S	S	S	MS	MS	MS	S	2.4 (12)	Lg buf	<u>Res.Sc1</u>
471	A 73400-3	<u>R</u>	S	MS	MS	MS	S	S	S	S	VS	3.5 (61)	Lg rus	<u>Det, F.Sdbl</u>
473	A 7411-2	MS	S	S	S	S	S	<u>MR</u>	<u>MR</u>	MS	VS	2.2 (21)	Ob1 rus	<u>Det.</u>
476	Ad 74197-1	<u>MR</u>	MS	MS	MS	MS	S	<u>S</u>	<u>S</u>	S	MS	2.0 (16)	Lg rus	<u>M.Sdbl</u>
478	A 74393-1	<u>VR</u>	<u>MR</u>	<u>MS</u>	MS	MS	S	VS	VS	VS	<u>MR</u>	2.9 (15)	Lg rus	<u>Res.Sc1</u>
479A	A 74543-5	<u>VR</u>	<u>MR</u>	<u>MS</u>	S	S	S	S	S	S	--	<u>3.2 (13)</u>	Lg wh	<u>Det, F.Sdbl</u>
486	A 7596-1	<u>VR</u>	<u>R</u>	<u>MR</u>	S	S	S	S	S	S	MS	<u>2.7 (40)</u>	Lg rus	<u>Res.Sc1, F.Sdbl</u>
487	A 75188-3	<u>VR</u>	<u>R</u>	<u>VR</u>	VS	VS	VS	S	S	S	MS	2.4 (27)	Ob1 buf	<u>Md.Sdbl, Res.</u> <u>Sc1, EB</u>
489	AD Wn 75197-14Rus	<u>VR</u>	<u>R</u>	<u>MR</u>	<u>MR</u>	<u>MR</u>	MS	<u>MR</u>	<u>MR</u>	<u>MR</u>	S	2.8 (20)	Lg rus	<u>V.Det.</u>
490	AD Wn 75201-12	<u>R</u>	<u>VS</u>	<u>VS</u>	<u>MR</u>	<u>MR</u>	MS	<u>MR</u>	<u>MR</u>	<u>MR</u>	MS	2.8 (34)	Lg wh	

83 Acc.	Identity	Scab	Vert-1/ MS	E. Die	CS <sup>2</sup> /PVY	Chr	CS	PLRV Net	Chr	Nema	Hort	Type	Other
497	A 77131-5	3/ MS	MR	MR	MR	MR	R	S	MS	S	2.3 (22)	5/ Lg rus	Sdb1
508	A 77311-1		MS	MR	R	S	S		S	--	2.6 (16)	Lg rus	Det., Res.Scl, M.Sdb1
526	A 7817-1	VR	S	S	MS	MS	S		S	--	2.0 (12)	Lg rus	V.Det.
527	A 7822-3	MS	MS	MS	S	S	R		R	MS	2.6 (16)	Lg wh	Res.Scl, M.Sdb1
534	A 7854-6	R	S	S	S	S	MS		MS	MS	2.8 (16)	Lg buf	Det., F.Sdb1
535	A 7856-6	MR	S	MS	MS	MS	S		S	MS	3.1 (13)	Lg rus	M.Sdb1, Det.
536	A 7858-7	MS	S	S	MS	MS	S		S	S	2.5 (17)	Lg rus	Det., Res.Scl
537	A 7865-19	MS	S	MS	S	S	MR		MR	--	2.2 (14)	Lg buf	Res.Scl, F.Sdb1
542	A 7870-1	VR	MS	MS	S	S	R		MR	--	1.5 (13)	Obl rus	Sdb1, V.Det.
543	A 7873-1	MS	MR	MR	MS	S	MS		MS	--	3.4 (13)	Obl lt.	Res.Scl.
544	A 7881-8	VR	VS	S	MS	MS	S		S	MR	2.9 (11)	Lg rus	V.Det., F.Sdb1
545	A 7896-7	VR	MS	MS	S	S	S		S	R	2.4 (14)	Lg lt.	V.Det.
546	A 78100-7	VR	S	MS	S	S	S		S	R	2.7 (16)	Lg rus	Res.Scl, M.Sdb1
547	A 78100-11	S	S	S	S	S	MS		S	MR	3.1 (15)	Lg rus	V.Det., F.Sdb1
548	A 78102-5	VR	S	MS	S	S	R		R	R	2.9 (15)	Lg rus	Det. Res.Scl, M.Sdb1
551	A 78239-1	MR	S	MS	S	S	S		S	--	2.8 (16)	Lg buf	Det., M.Sdb1
553	A 78243-1	MR	VS	MS	MS	S	S		S	--	3.1 (15)	Lg rus	Res.Scl, M.Sdb1
702	BC 9289-1	S	MR	VS	R	MR	S		VS	--	2.4 (17)	Obl rus	Res.Scl, M.Sdb1
717	DTD-2CIP	MS	MR	VS	MR	MR	VS		VS	VS	1.6 (8)	Rnd buf	Det.
718	DTD-33CIP	VR	MS	S	MS	MS	R		R	--	1.3 (7)	Rnd wh	Sdb1
729	IP 12-1-27	S	R	MR	VS	MS	MS		MR	MS	2.1 (16)	Obl wh	
730	IP 12-1-28	MR	R	R	VS	VS	S		MR	VS	1.8 (17)	Obl wh	
733	LT-1CIP	S	S	S	S	S	MS		MR	--	2.6 (5)	Rnd wh	
775	ND 14-1	MR	VS	VS	MS	MS	S		S	R	2.4 (42)	Lg rus	V.Det., M.Sdb1
777	NDD 47-1	S	MR	MR	VS	VS	S		VS	MR	2.9 (49)	Obl wh	M.Sdb1, Res.EB, PM
782	ND 534-4	MS	VS	S	MR	S	S		S	MS	4.1 (21)	Lg rus	V.Det.
783	ND 722-2	R	VS	VS	S	S	S		S	S	2.2 (11)	Obl rus	F.Sdb1, V.Det.
784	NDA 848-3	R	MS	VS	S	S	S		S	S	2.2 (17)	Obl rus	
796	NDA 8694-3	MR	VS	VS	VS	R	R		S	VS	2.5 (31)	Obl rus	Sdb1, V.Det.
797	Neb 169-69-1	VS	S	MS	VS	VS	VS		VS	VR	2.6 (37)	Rnd wh	M.Sdb1, V.Det, Res.PM
798	Neb A 21970-3	VR	VS	VS	S	S	S		S	MR	2.2 (20)	Rnd buf	Sdb1, V.Det.
800	NY 59	VS	R	R	VR	MR	MS		MR	S	3.3 (21)	Rnd wh	
801	NY 63	S	MS	MS	MR	S	MS		S	VS	2.6 (15)	Rnd wh	
809	NYA 158-1	VS	MR	R	MS	MS	MR		R	VS	2.3 (13)	Rnd wh	M.Sdb1
818	NYR 247-1	VS	MR	MR	MS	MR	R		MR	VS	2.1 (16)	Rnd wh	sdb1

Washington Table 6. (continued)

- 1/ Abbreviations in heading: Vert = Verticillium wilt; E. Die = Early dying from early maturity, early blight, Sclerotinia wilt, powdery mildew and Verticillium wilt combined; PVY = potato virus Y; PLRV = potato leafroll virus; Nema = Columbia root-knot nematode; Hort = overall rating based on visual observation of tubers at harvest; Type = shape and russetting of tubers; Other = other valuable attributes.
- 2/ CS = current season symptoms, Chr = chronic symptoms, Net = net necrosis.
- 3/ Disease resistance rated on 1 to 5 scale in field disease nurseries with 1 = very susceptible and 5 = very resistant. Very susceptible (VS) = Ave. of 1 to 1.6, S = 1.7 to 2.3, moderately S = 2.4 to 3.0, Moderately resistant = 3.1 to 3.6, R = 3.7 to 4.3 and VR = 4.4 to 5.0. Most averages based on 4 to 30 observations.
- 4/ Overall horticultural attributes rated on 1-5 scale with 1 = very poor, 5 = very good. Number in parenthesis = number of reps that have been rated.
- 5/ Lg = long, obl = oblong, rnd = round, rus = russet, buf = buff colored, wh = white.
- 6/ Res = resistant, Scl = Sclerotinia wilt, EB = Early blight, PM = powdery mildew, M = many, F = few, Sdbl = seedball, V.Det = very determinant plant.

Washington Table 7. Disease resistance profiles of lines being added to Prosser Meristem Repository as determined in disease nurseries conducted near Prosser, Washington during 1977 to 1983.

83 Acc.	Identity	Scab	Vert- <sup>1/</sup>	E. Die	CS- <sup>2/</sup> PVY	Chr	CS	PLRV Net	Chr	Nema	Hort	Type	Other
15	Michimac	VS- <sup>3/</sup>	MS	MS	R	MR	MS	MS	S	MS	4/ 2.9 (37)	5/ Obl wh	6/ M.Sdbl
17	Shepody	S	MS	S	S	S	S	S	S	S	3.0 (13)	Lg wh	
18	Roza	VS	R	MS	MR	S	R	MR	S	MS	2.8 (19)	Rnd wh	
19	Delta Gold	S	MR	VS	VS	S	MR	MR	MS	MS	2.6 (31)	Rnd wh	M.Sdbl, V.Det.
20	Penrose	MR	MS	MS	S	MS	MR	MR	MS	MS	2.6 (20)	Rnd red	M.Sdbl, Det.
25	Rideau	VR	S	S	MR	MS	MR	MR	MR	MS	3.4 (25)	Obl red	
28	Vokal	S	VS	VS	S	S	R	R	R	MS	1.9 (9)	Lg wh	Det.
29	Atzimba	MR	MS	MS	VS	VS	R	R	MR	VS	2.4 (17)	Obl wh	M.Sdbl
30	Abinaki	R	S	S	MR	MR	R	R	MR	S	2.7 (10)	Rnd wh	Det.
36	Conestoga	S	VS	MR	MS	S	MS	MS	MR	S	2.5 (16)	Rnd wh	M.Sdbl, Det.
37	Teton	S	S	S	S	S	MS	MS	S	MR	2.2 (14)	Obl wh	Sdbl
38	Trent	MR	VS	VS	S	VS	S	S	VS	S	1.7 (14)	Rnd wh	F.Sdbl, V.Det.
101	WnC 285-18	MR	MR	MS	MS	VS	MR	MS	S	MS	2.5 (76)	Lg rus	
106	WnC 345-15	R	MS	S	VS	VS	S	S	MS	VS	2.7 (73)	Lg rus	M.Sdbl, Det.
123	Wn 705-168	S	MS	S	MS	R	S	S	VS	S	1.9 (17)	Lg rus	M.Sdbl, Det., Res.PM
129	Wn 705-576	MS	R	MR	VS	VS	MR	MR	S	R	2.1 (35)	Obl buf	M.Sdbl, Res.PM
207	78 Ds-16	R	R	R	MR	R	VS	VS	VS	MR	1.6 (17)	Lg wh	F.Sdbl
208	78 Ds-20	R	R	MR	VS	VS	MR	MR	R	MS	1.8 (14)	Obl wh	F.Sdbl
214A	78 Ds-99 (dupl)	S	S	S	VS	VS	VS	VS	S	S	2.7 (22)	Obl wh	M.Sdbl, Det.
219A	79 Ds 500-18	--	MS	MS	VS	VS	MR	MR	R	MS	1.9 (10)	Obl buf	Det.
220	79 Ds 500-19	MS	MR	MS	S	S	MR	R	R	--	1.8 (13)	Lg wh	Det.
225	79 Ds 500A-11	VS	R	R	S	S	R	R	R	MS	1.8 (13)	Obl wh	F.Sdbl
226	79 Ds 500A-35	MR	MS	MS	S	S	R	R	R	VS	1.5 (21)	Lg wh	
233	80 Ds-6	VR	R	R	S	S	VS	VS	VS	VS	1.6 (13)	Obl wh	
234	80 Ds-9	VR	R	R	S	S	VS	VS	VS	--	2.4 (9)	Lg wh	
237	80 Ds-16	VR	MR	MR	S	S	VS	S	S	--	2.6 (7)	Lg wh	F.Sdbl
240	80 Ds-10	MR	VR	MR	VS	VS	S	S	VS	--	2.4 (5)	Lg wh	Det.
241	80 Ds-11	VR	S	MS	S	S	S	S	S	--	1.5 (8)	Lg rus	Det.
242	80 Ds-14.1	R	MR	R	S	S	MR	MR	MR	R	2.5 (6)	Obl rus	Det.
243	80 Ds-14.2	MR	R	VR	VS	VS	MR	MR	MR	--	2.3 (6)	Rnd wh	Det.
246	80 Ds-23	VR	MR	R	MS	S	MR	MR	S	S	2.4 (14)	Rnd wh	F.Sdbl
251	80 Ds-T42	--	VR	R	MR	MR	MS	MR	MR	--	1.5 (4)	Lg wh	
252	80 Ds-T43	--	MR	MS	VS	VS	MR	MR	MR	--	1.5 (2)	Obl wh	
253	80 Ds-T74	VR	MR	MR	R	R	VS	VS	S	VS	1.8 (15)	Lg wh	F.Sdbl



Washington Table 7. (continued)

83 Acc.	Identity	Scab	Vert <sup>1/</sup>	E. Die	CS <sup>2/</sup>	PVY Chr	CS	Net	Chr	Nema	Hort	Type	Other
701	B 9164-1	MS <sup>3/</sup>	VS	S	VS	VS	R		R	MS	4/	5/	6/
704	B 9391-2	VS	--	VS	R	R	MS		MS	--	1.7 (14)	Lg rus	Det.
705	B 9398-2	VS	VS	S	VS	VS	MR		R	VS	1.6 (8)	Obl rus	V.Det.
706	B 9399-1	VS	VS	VS	VS	VS	S		R	VS	2.0 (6)	Obl rus	V.Det.
720	F 67128	S	VS	VS	MS	VS	R		MS	S	1.8 (9)	Obl rus	V.Det., F.Sdbl
721	F 70021	MS	--	VS	VS	VS	MS		MS	VS	2.7 (9)	Obl wh	Det.
725	G 654-2	S	VS	VS	MR	MR	S		S	S	1.9 (11)	Obl wh	V.Det.
732	LS 2941-5	S	VS	MS	VS	VS	MR		MR	S	2.6 (16)	Rnd wh	V.Det.
735	MEAF 221-1	S	MS	MS	S	MR	R		S	S	2.0 (5)	Rnd, pur wild	M.Sdbl
779	ND 277-2	Not tested yet									2.9 (11)	Lg buf	F.Sdbl
780	ND 388-1	VR	VS	S	S	VS	S	MS	MS	VS	3.0 (21)	Lg rus	V.Det.
790	NDA 1235-2	VS	VS	S	MR	MR	S		S	--	2.9 (13)	Rnd wh	Sdbl
791	NDA 1309-5	MS	VS	MS	S	VS	S		VS	--	3.2 (9)	Lg rus	Res.Scl
802	NYR 112-1	--	S	MS	MR	MR	R		MS	--	2.5 (4)	Rnd Wh	
804	NYB 113-34	S	VS	S	MS	MR	MR		MS	--	2.0 (8)	Rnd wh	Sdbl, Det.
805	NYA 128-1	VS	VS	S	R	MR	MS		MS	--	2.1 (9)	Rnd wh	M.Sdbl, Det.
806	NYA 140-11	VS	S	S	MR	MR	S		MS	--	1.9 (7)	Rnd wh	Sdbl
814	NYA 231-1	VS	VS	S	MR	MR	S		MS	MS	2.4 (16)	Obl buf	M.Sdbl, Det.
817	NYR 241-16	VS	S	MR	R	MR	VR		VR	--	1.8 (11)	Rnd wh	Sdbl
819	NYR 247-7	S	S	VS	MR	MR	MR		MR	--	2.4 (8)	Rnd buf	F.Sdbl, Det.
823	Ok1 4890-A3	R	MS	MR	MS	MS	R		R	--	1.1 (8)	Lg pur wild	
824	TC 2-1	VR	VS	VS	S	S	MS		MS	MS	1.6 (13)	Lg rus	M.Sdbl, Det.
851	X 927-3	S	MS	MS	MR	MR	MS		MS	MS	2.2 (13)	Obl buf	M.Sdbl

<sup>1/</sup> Abbreviations in heading: Vert = Verticillium wilt; E. Die = Early dying from early maturity, early blight, Sclerotinia wilt, powdery mildew and Verticillium wilt combined; PVY = potato virus Y; PLRV = potato leafroll virus; Nema = Columbia root-knot nematode; Hort = overall rating based on visual observation of tubers at harvest; Type = shape and russetting of tubers; Other = other valuable attributes.

<sup>2/</sup> CS = current season symptoms, Chr = chronic symptoms, Net = net necrosis.

<sup>3/</sup> Disease resistance rated on 1 to 5 scale in field disease nurseries with 1 = very susceptible and 5 = very resistant. Very susceptible (VS) = Ave. of 1 to 1.6, S = 1.7 to 2.3, moderately resistant = 2.4 to 3.0, moderately resistant = 3.1 to 3.6, R = 3.7 to 4.3 and VR = 4.4 to 5.0. Most averages based on 4 to 30 observations.

<sup>4/</sup> Overall horticultural attributes rated on 1-5 scale with 1 = very poor, 5 = very good. Number in parenthesis = number of reps that have been rated.

<sup>5/</sup> Lg = long, obl = oblong, rnd = round, rus = russet, buf = buff colored, wh = white, red = red skin, wild = exotic species, pur = purple skin and flesh.

<sup>6/</sup> Res = resistant, Scl = Sclerotinia wilt, EB = Early blight, PM = powdery mildew, M = many, F = few, Sdbl = seedball, V.Det = very determinant plant.

83 Acc.	Identity	Scab	Vert- 1/	E. Die	CS- 2/ PVY	Chr	CS	PLRV Net	Chr	Nema	Hort	Type	Other
256	79 Ds 511-5	3/ --	S	S	MR	MR	S	S	S	--	4/ 2.0 (3)	5/ Obl wh	6/ Res.Scl
407	A 69870-3	VR	R	MR	S	VS	MS	MS	S	MS	2.8 (28)	Lg rus	Res.Scl
410	A 711076-9	MR	MS	S	VS	VS	MR	MR	MR	MS	2.4 (11)	Obl buf	Det.
418	A 72545-2	MS	R	MR	VS	VS	VS	S	VS	S	3.5 (34)	Lg buf	F.Sdbl, Res.Scl
469	A 72685-2	MS	MS	MS	VS	VS	VS	VS	VS	MR	3.1 (59)	Lg rus	Res.Scl
472	A 73496-1	MS	S	MS	S	MS	R	R	R	S	1.2 (11)	Obl buf	M.Sdbl
	A 74114-4	Not tested yet											
	A 74123-7	Not tested yet											
475	A 74133-1	VR	MR	MS	MR	MR	MS	MS	MR	--	2.4 (19)	Lg lt rus	M.Sdbl
477	A 74212-1	R	MS	MS	S	S	S	S	MR	MS	2.9 (15)	Lg buf	M.Sdbl
481	A 74708-7	--	S	MS	S	S	MR	MR	R	--	1.4 (5)	Lg pink	Sdbl
488	AD Wn 75197-14wh	MS	MR	MR	S	S	S	MR	MR	MS	3.4 (40)	Obl wh	M.Sdbl, Res.Scl, PM
496	A 7712-5	R	MS	MS	VS	VS	S	S	MR	MS	1.9 (25)	Obl buf	Det.
502	A 77232-3	VR	MS	S	VS	VS	R	S	MR	MR	2.6 (32)	Obl rus	Det.
506	A 77308-5	VR	VS	MS	S	S	MR	MR	MR	--	1.9 (10)	Lg rus	F.Sdbl
518	AC 77652-1	VS	VS	VS	VS	VS	R	R	R	MS	1.9 (8)	Obl rus	M.Sdbl, V.Det.
524	A 7815-7	R	MS	S	S	S	MS	S	S	--	2.6 (14)	Lg rus	Det, M.Sdbl
525	A 7816-14	VR	S	MS	S	S	S	S	MS	--	2.7 (13)	Lg rus	F.Sdbl
528	A 7827-9	VR	VS	VS	MR	MR	S	S	S	--	3.4 (9)	Lg rus	Sdbl
529	A 7836-7	MR	S	S	S	MS	S	S	MS	--	2.7 (10)	Obl rus	Det.
541	A 7869-20	MR	S	MS	S	S	S	S	MR	--	2.4 (13)	Lg rus	V.Det.
549	A 78105-5	VR	S	S	S	S	S	S	MR	--	2.3 (9)	Lg wh	Sdbl
552	A 78242-4	R	S	MR	VS	VS	VS	VS	VS	--	2.7 (12)	Lg rus	M.Sdbl, Res.Scl
670	ADX 195-3	MS	MR	MS	MR	MR	VR	VR	VR	S	1.1 (16)	Lg wh, wild	
675	ADX 277-4	R	--	MS	MS	MR	VR	VR	VR	S	1.0 (4)	Rnd res	Det.
680	ADX 370-9	VS	VS	VS	S	S	MS	MS	MR	MS	1.0 (10)	rus, wild	
682	ADX 394-1	R	VS	S	S	S	R	R	R	MS		Lg red	Det.
683	ADX 399-3	VR	VS	S	S	S	R	R	R	VS	1.0 (14)	Obl red	
684	ADX 406-1	VR	--	MS	MR	MS	MR	R	R	VS	1.0 (14)	Obl red	
692	ATD 63-4	S	VS	MS	S	VS	R	R	R	S	1.0 (9)	Lg red, wild	
696	B 8833-6	S	VS	S	VS	VS	R	R	R	--	1.5 (11)	Obl buf	
698	B 8934-4	S	VS	S	VS	VS	R	R	R	VS	1.8 (9)	Lg buf	V.Det, Sdbl
										--	1.6 (8)	Obl buf	V.Det, Sdbl

WEST VIRGINIA

R. J. Young

Tuber Resistance  
to P. infestans

Screening potato clones for non-hypersensitive resistance has traditionally been done under field conditions. Variations in soil and environmental conditions require that the test be repeated several years in order to determine more accurately how a potato clone might react to the disease under various conditions. This procedure is time consuming and expensive, but to draw conclusions about the resistant nature of a clone from a single exposure would be highly risky. Susceptible clones are easily identified however, immune or resistant ones constitute the real problem and require repeated exposure to the pathogen before their resistance posture can be characterized.

Screening for resistance to P. infestans using the tuber rather than the foliage would have important advantages. Better control of the environment through the inoculation, ingression, and infection processes of the disease cycle would lead to a more sound assessment of resistance.

Reported here are the results from screening several sources of tuber stocks for quantitative and qualitative resistance to P. infestans using a tuber slice method. Inoculum was standardized to 40,000 zoospores/ml, and applied to the fresh cut slice on a 10 mm antibiotic assay disc. One cm thick tuber slices were taken from tubers stored at 4° C for three months. Tubers were first equilibrated at 20° C for 48 hrs, washed and then surface sterilized in 20 percent commercial chlorox for 10 minutes prior to inoculation.

Inoculated tuber slices were incubated in the darkness at 19° C for 15 days and evaluated according to the following multiple sense impression scale:

- 1 = No infection (slight hypersensitive browning).
- 2 = Initial signs of infection, tissue discoloration; invasion slow with little to no sporulation.

3 = Vigorous invasions by P. infestans with mycelium and sporulation present.

The results of these test are presented in the following tables.

West Virginia Table 1. Tuber reaction to nine Andigenia selections from agriculture Canada's potato breeding program to infection by three races of P. infestans.

Pedigree*	Races of <u>P. infestans</u>		
	Race - 0	Race - 1,4	Race - 1,2,3,4
A 105	1	1	1
A 132	1	1	1
A 203	1	1	1
A 249	1	1	1
A 276	1	1	1
A 298	1	1	1
A 453	1	1	1
A 505	1	1	1
A 541	1	1	1

\* All pedigrees showed immunity (hypersensitivity) to potato race-1,4 P. infestans in the 1982 field test.

West Virginia Table 2. Tuber reaction to seven *Andigena* selections from the Cornell potato breeding program to infection by *P. infestans*.

Pedigree*	Races of <i>P. infestans</i>		
	Race - 0	Race - 1,4	Race - 1,2,3,4
A 140-4	3	3	3
A 140-6	3	3	3
A 140-11	1	1	1
A 146-9	1	2	2
A 158-1	1	2	2
A 282-4	1	1	1
S 377-41	3	3	3

\* All pedigrees showed immunity (hypersensitivity) to potato race-1,4 *P. infestans* in the 1982 field test except for S 377-41 which was susceptible.

West Virginia Table 3. Tuber reaction to seven R-gene indicator plants to infection by three races of *P. infestans*.

Pedigree	Races of <i>P. infestans</i>		
	Race - 0	Race - 1,4	Race - 1,2,3,4
Katahdin ( $R_0$ )	3	3	3
NY59 ( $R_0$ )	1	3	3
Kennebec ( $R_1$ )	1	1	2
3R-8 ( $R_2$ )	1	1	3
Pentland Ace ( $R_3$ )	3	3	3
1563-14 ( $R_4$ )	3	3	3
B6086-WV21 ( $R_1 R_2 R_3$ )	1	1	2

West Virginia Table 4. Tuber reactions of 44 selections from a single family cross\* to P. infestan races 0; 1,4; and 1,2,3,4 after 60 and 90 days storage at 4° C.

Tuber Reaction	Number Reacted	Percentage
1 Immunity to all three races, test one and test two.	14	32.0
2 Immunity to all three races test one, resistant (2 rating) to all three races test two.	3	7.0
3 Immune to race-0 test one and two, and resistant (2 rating) to races 1,4 and 1,2,3,4 test one and two.	4	9.0
4 Immune to race-0 test 1 and 2 and suse. (3 rating) to races 1,4 and 1,2,3,4 test one and two.	10	23.0
5 Immunity all three races test one, immunity to race-0 and resistant race 1,4 and 1,2,3,4 test two.	1	2.0
6 Resistant (2 rating) to all three races test one and two.	5	11.0
7 Susceptible (3 rating) all three races in test one and two.	4	9.0
8 Response different to those listed above.	3	7.0

\* Tubers selected from a cross BR5991-WV16 X Campbell 13.



## WISCONSIN

R. E. Hanneman, Jr.

### Genetics and Cytogenetics of the Tuber-bearing Solanum Species. (Cooperative USDA, ARS and Wisconsin Experiment Station)

Assignment of Endosperm  
Balance Numbers (EBN)  
to the Tuber-bearing  
Solanum Species

Endosperm Balance Numbers (EBNs) are being assigned to species in the Inter-Regional Potato Introduction Project (IR-1) collection based on their crossability to several species or clones used as EBN standards. The 1EBN standards used are 2x Solanum cardiophyllum ssp. cardiophyllum and/or 2x S. commersonii ssp. commersonii; the 2EBN standards used are 2x S. chacoense and 2x Gp. Phureja, and the 4EBN standards used are 4x S. chacoense and/or 4x Gp. Andigena. Each species tested has been crossed with one or both of the standards for each EBN level. Pollen tube growth in the style, seed set, and ploidy of the progeny have been analyzed as a part of the EBN determination.

The EBNs of over 70 species belonging to 11 series have been determined. Both 2x(1EBN) and 2x(2EBN) species have been identified as well as 4x(2EBN) and 4x(4EBN). All 6x species are 4EBN. This means that 2x species can be isolated from each other, as can 4x species, if they differ in EBN. It also means that 2x(2EBN) species can be crossed directly with 4x(2EBN) species, and 6x(4EBN) species can be crossed directly with 4x(4EBN) species. In addition, no species has been assigned to more than one EBN level. All subspecies of the same ploidy level have been found to have the same EBN. All species that cross at two different EBN levels, always cross more freely and have higher seed set at one EBN level than at the other.

The North American species are markedly different in EBN from the South American species. Among the North American species, most diploids are 1EBN, most tetraploids are 2EBN, and all hexaploids are 4EBN, while among South American species most diploids are 2EBN, most tetraploids are 4EBN and again all hexaploids are 4EBN. Only two tuber-bearing South American diploid species are known to be 1EBN, while all North American diploids except S. verrucosum are 1EBN. Only one 4x(2EBN) species is known among South American tetraploid species, excluding 4x species of Series Conicibaccata, but all North American

tetraploid species determined thus far are 2EBN. These findings explain the major crossing difficulties so inherent in the past in the use of North American species in potato improvement.

These findings have direct implications for potato improvement. Any 4x(4EBN) cultivar should cross with most 4x South American and 6x South and North American species. Haploids [2x(2EBN)] of cultivars should cross with most 2x South American species and 4x North American species. All 2x(1EBN) North American species should be crossable with 2x(2EBN) haploids of cultivars through 2n gametes or chromosome doubling of the parental species. The use of the EBN concept can contribute effectively to germplasm transfer in potato improvement.

#### The Genetics of Endosperm Balance Number (EBN).

Exceptional diploid  $F_1$  hybrids of 2x(1EBN) S. commersonii and 2x(2EBN) S. chacoense have been used for the determination of the number of genes controlling Endosperm Balance Number (EBN) in these species. Four diploid S. commersonii (cmm) x S. chacoense (chc) hybrids were entered into a complete diallel along with the two species parents. This full diallel allowed all possible reciprocal combinations of sibbing and backcrossing to be done. After crossing, groups of ten fruit from each cross were selected and tabulated for the number of seeds and the number of aborted seeds. A seed was judged to be aborted by either of two criteria, 1) a failure of development beyond an early stage resulting in no endosperm or embryo development, or 2) a totally collapsed mature sized seed. Variation in seed size was also seen both within and between crosses).

The trends observed were:

1.  $F_1$  x  $F_1$  crosses: moderate seed set; segregation for seed size; plump seeds apparently outnumbering aborted seed.
2.  $F_1$  x cmm: similar seed set to sib-matings; seed average to small sized; aborted seed slightly outnumbering plump seeds.
3. cmm x  $F_1$ : very low seed set; developed seeds average to large; aborted seed greatly outnumbering plump seeds.
4.  $F_1$  x chc: low seed set; average to large seeds; aborted seeds greatly outnumbering plump seeds.

5.  $chc \times F_1$ : low to moderate seed set; average to small seed; aborted seed slightly outnumbering plump seeds.

The results of reciprocal crosses are not identical. It can be seen, however, that the results of two sets of crosses are similar: 1)  $cmm \times F_1$  and  $F_1 \times chc$ , and 2)  $chc \times F_1$  and  $F_1 \times cmm$ . This similarity appears correlated to the relative EBN values of the female and the male in each cross. In the first two crosses the female has a lower EBN ( $1EBN \times 1-1/2EBN$  and  $1-1/2EBN \times 2EBN$ , respectively) and in the latter two the female has a higher EBN ( $2EBN \times 1-1/2EBN$ , and  $1-1/2EBN \times 1EBN$ , respectively). Thus, cross results are consistent with the magnitude of EBN differences and the direction of the cross.

A three gene model is being developed for EBN with four basic assumptions: 1) each gene within a parental species has equal effects; 2) the genes within  $chc$  have double the effect of those within  $cmm$ ; 3) the genes are unlinked, and 4) a slight excess female dosage is tolerated in the endosperm, but results in diminished endosperm and ultimately in smaller seeds. Within this model an  $F_1$   $cmm \times chc$  hybrid generates a gametic array of 3/6, 4/6, 5/6 and 6/6 EBN types in a polynomial distribution of 1:3:3:1, respectively.

The predictions of this model are:

$F_1 \times F_1$ : average and small seeds, 35 seeds/29 abortions.  
 $F_1 \times cmm$ : average and small seeds, 1 seeds/1 abort.  
 $cmm \times F_1$ : average seeds, 1 seed/7 abortions.  
 $F_1 \times chc$ : average seeds, 1 seed/7 abortions.  
 $chc \times F_1$ : average and small seeds, 1 seed/1 abort.

These results match actual data closely except for  $F_1 \times F_1$  crosses. If an overall fertility estimate is made for each  $F_1$  clone (average total number of seeds and abortions per fruit),  $F_1 \times F_1$  data also fit closely in most cases. Advanced crossing data will be tested against model predictions and observations will be made of correlations between seed size and crossability.

Investigation of the Basis  
for Differences in  
Reciprocal Tuberosum-  
Andigena Hybrids.

In 1980, John Sanford reported several observations concerning reciprocal differences. He concluded that mere cytoplasmic or nuclear-cytoplasmic explanations may not

adequately account for the reciprocal differences observed. Moreover, his data suggested that gibberellic acid (GA) level differences may be the underlying basis for these differences. Although a case was made for the role of GA as the regulator of maturity, flowering, tuberization, and photoperiod, a simple explanation for the mode of inheritance for reciprocally different GA levels was not found. Speculation in this regard included long-term maternal effects or "dauermodification."

A simpler explanation for observed reciprocal differences would be a difference in the actual genetic constitutions of the reciprocal families. This difference could be due to gametophytic selection. Since differential GA levels in the parents have already been implicated in the observed reciprocal differences, GA seems a likely candidate for the agent of gametophytic selection as well.

This hypothesis was tested by comparing progeny of normal pollinations with those obtained by mixing pollen with an aqueous GA solution. In all of the five tetraploid *Tuberosum*-*Andigena* families resulting from such treatments, the mean tuber yields of progeny resulting from normal pollinations exceeded those from GA pollinations. In three of these families the difference was significant with 85, 90+ and 98% confidence. These results are consistent with expectations if we assume that styles deficient in GA select for pollen tubes which themselves produce more GA. [Pollen tube growth rate has been reported to be markedly increased in the presence of GA.] If only GA producing male gametes effect fertilization, the resulting population should also be relatively higher in GA production, assuming that a correlation exists between gametophytic and sporophytic GA production. The application of high levels of GA to the pollen would presumably prevent such selection from taking place. Future experiments will attempt to confirm this hypothesis.

#### The Use of Activated Charcoal in Potato Seed Germination.

It was observed that the addition of activated charcoal (AC) to seeds in petri dishes which had been pretreated with gibberellic acid (GA) had a striking effect on their rate of germination. Experiments were conducted to characterize the biological basis and practical usefulness of this phenomenon. It soon became apparent that AC hastens the process of germination (typically 2-5 days), but does not promote an ultimate increase in percent



germination. The most interesting observations concerned AC's effect on the germination rate of very slow germinating seeds and on the efficiency of chromosome doubling.

In one slow germinating seed lot of S. chomatophilum, it was found that AC (applied after GA pretreatment) shortened the time required for 50% germination by about two weeks. Future experiments will determine if significantly faster germination is a general response of slow germinating seed lots to AC.

S. fendleri seeds, which had been pretreated with GA and surface sterilized, were treated with 0.1% colchicine by the normal procedure for chromosome doubling. Another lot of these seeds was simultaneously treated with 0.1% colchicine + 1% AC. When the radicle emerged 2-3 mm, the sprouts were washed and aseptically transferred to nutrient agar. Percent germination, leaf number, and percent normal (unswollen) cotyledons/hypocotyls were significantly (95% confidence) greater for the treatment with AC after 17 days. Root vigor was greater with 85% confidence. While none of the AC treated seedlings were killed, about 20% treated with colchicine alone were. These differences appeared to be largely due to the faster sprouting and earlier removal from colchicine of the AC treated seeds.







